No. 631,125. Patented Aug. 15, 1899.

E. F. PFLUEGER.

SOLDERING MACHINE.

(Application filed Mar. 28, 1899.)

(No Model.) 3 Sheets—Sheet 1.

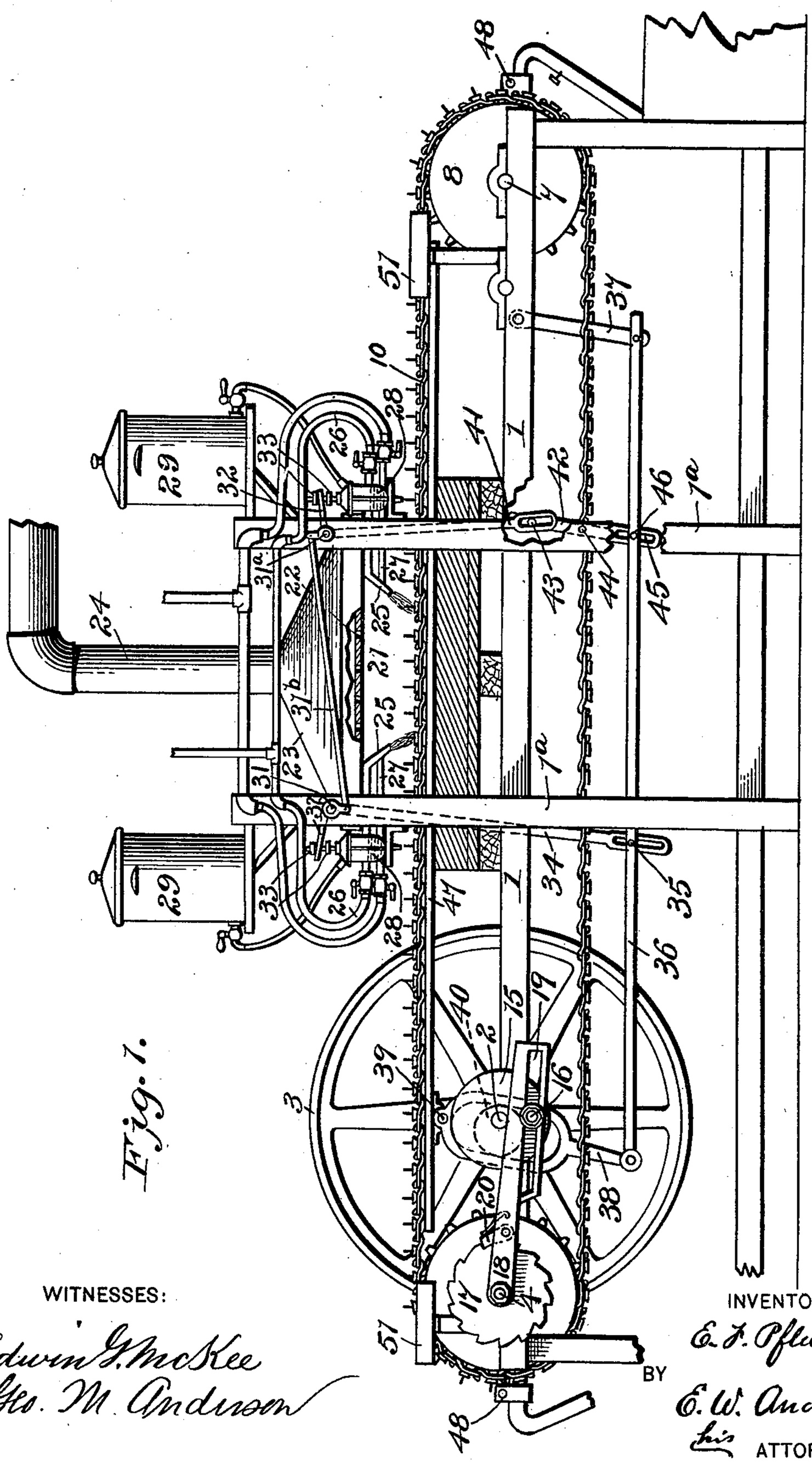

Fig. 1.

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Fig. 2.

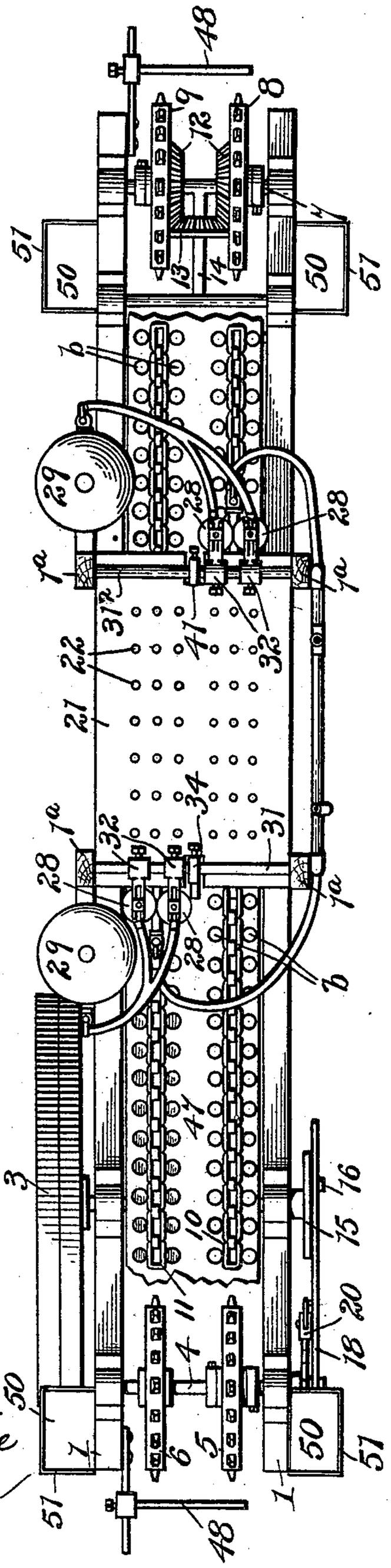

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Fig. 4.

Fig. 7.

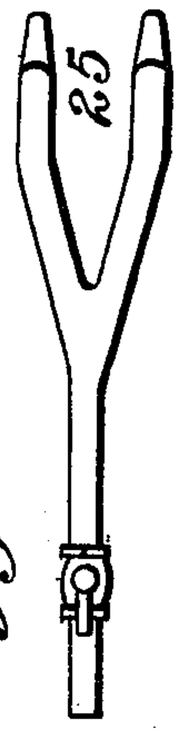


Fig. 8.

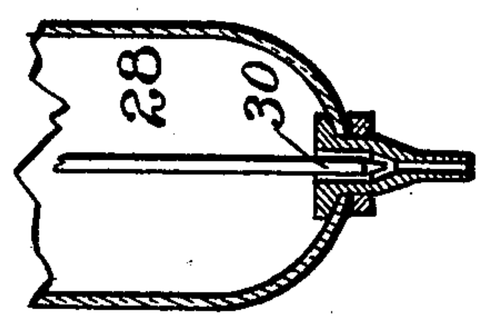


Fig. 6.

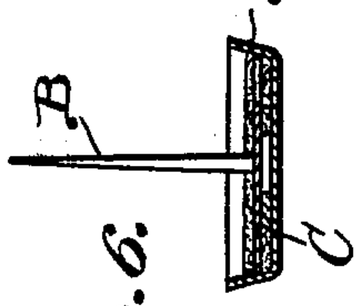


Fig. 3.

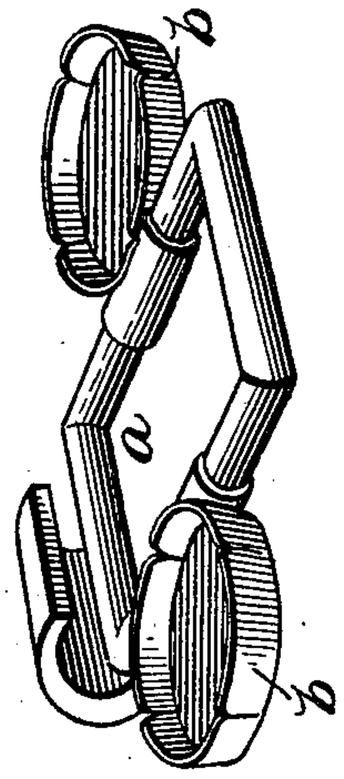
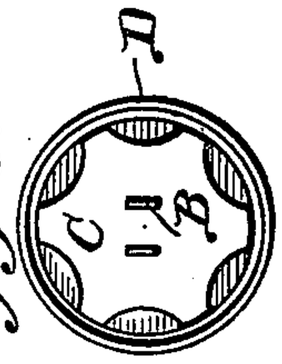


Fig. 5.



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UNITED STATES PATENT OFFICE.

ERNEST F. PFLUEGER, OF AKRON, OHIO.

SOLDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 631,125, dated August 15, 1899.

Application filed March 28, 1899. Serial No. 710,793. (No model.)

To all whom it may concern:

Be it known that I, ERNEST F. PFLUEGER, a citizen of the United States, and a resident of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Soldering-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side elevation of the invention, partly in section. Fig. 2 is a plan view of same with hood removed and partly broken away. Fig. 3 is a detail view of one of the carrier-links. Fig. 4 is a detail view of parts of a harness-button to be soldered. Fig. 5 is a plan view of same parts assembled. Fig. 6 is a sectional view of same as soldered. Figs. 7 and 8 are detail views of burner-pipe and acid-cup valve, respectively.

This invention is designed to provide a machine of simple and practical character for the purpose of soldering together in a rapid and efficient manner the parts of certain articles. It is particularly adapted for use in the manufacture of that kind of harness trimmings and ornaments and other devices for whatever purpose used wherein nails, prongs, or securing-shanks are fastened by means of solder to a concave or cup-shaped head or body — such, for instance, as the devices shown in Figs. 4, 5, and 6 of the drawings.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, the numeral 1 designates the frame of a machine embodying my invention. 2 is a main driving-shaft journaled transversely at one end portion of the frame and driven by a pulley 3, and 4 is a parallel shaft on which are mounted two sprocket-wheels 5 and 6. On the opposite end portion of the frame is a fixed shaft 7, upon which are loosely mounted two similar sprocket-wheels 8 and 9. Carried by the respective pairs of wheels 5 and 8 and 6 and 9 are two endless sprocket carrier-chains 10 and 11, upon which the work is placed and soldered in the manner hereinafter described. Each of these chains in the construction shown is composed of a series of connected links, (one of which is shown in detail,) each of which is composed of a central portion *a*, which constitutes the link proper, and two lateral cups or receptacles *b*, which form the holders for the work. While both of these chains may be driven in the same direction, yet for convenience in feeding and operating I have usually preferred to run them in opposite directions. I also run said chains with an intermittent motion in order to give intervals of rest during which the work may be better placed thereon and acid may be fed, and for accomplishing these two results I arrange the driving-gear and operating devices as follows: The sprocket-wheel 5, above referred to, is rigidly secured to the shaft 4, while the wheel 6 is loosely mounted thereon to permit it to revolve in the opposite direction to the wheel 5. On the inner side of each of the sprocket-wheels 8 and 9 and rigidly secured thereto is a bevel gear-wheel 12, and meshing with these two wheels is a central bevel-toothed pinion 13, which is loosely mounted on a stud-shaft 14, placed at right angles to the shaft 7, which in the present instance is shown as being integral therewith. On the end of the main driving-shaft 2 is fixed a disk 15, having a crank-pin 16, and on the corresponding end portion of the shaft 4 is rigidly mounted a ratchet-wheel 17. Fulcrumed at one end portion on the shaft 4 is a bar 18, having at its opposite end portion an elongated longitudinal slot 19, which engages the crank-pin 16. Said bar also carries a spring-pressed pawl 20, which engages the teeth of the ratchet-wheel 17. The rotation of the main driving-shaft 2 through this connecting-bar and the pawl and ratchet causes an intermittent rotary movement of the shaft 4, and thereby of the carrier-chain 10, and through the bevel-gearing 12 and 13 the sprocket-wheel 9, chain 11, and sprocket-wheel 6 are moved in the opposite direction.

Placed upon the central portion of the machine is a horizontally-extending oven 21, open at its ends to permit the chains to pass therethrough. The upper wall of this oven is per-

forated, as indicated at 22, and these openings communicate with the interior of a superimposed hood 23 of a ventilator 24.

25 designates gas-burners located in the ends of the oven adjacent to, but slightly above, the plane of movement of the upper stretches of the carrier-chains. These burners are supplied with gas by means of connecting-pipes 26.

27 designates air-pipes which terminate within the burners and which are designed to be connected with a suitable fan or blower. (Not shown.) Other suitable burners may, however, be provided.

28 designates cups for containing acid. Two of these cups are mounted at each end of the oven in positions respectively to discharge each upon one series of the cups or receptacles *b* of the chains as each cup is about to enter the oven. Each cup is supplied with acid from an elevated tank or receptacle 29. Each cup is provided with a plunger-valve 30, which controls its discharge, being similar to the self-feeding oil-cups used in machinery. For the purpose of controlling the operation of the said valves the following devices are provided: Rock-shafts 31 31ª are journaled transversely in uprights 1ª of the frame, adjacent to each pair of cups, and fastened to these shafts are slotted rocker-arms 32, which engage the upper projecting portions of the stems of the said valves, the engagement being secured by means of nuts 33. Connected to the rock-shaft 31 is a lever 34, whose slotted lower end portion engages a pin or stud 35 on a parallel-motion bar 36. Said bar is supported at one end portion by a pivoted hanger 37 and at its opposite end portion is pivotally connected to the lower end of a slotted yoke 38, pivoted at 39 and engaging an eccentric 40 on the main driving-shaft 2. The rock-shaft 31ª is connected to said bar 36 by means of levers 41 and 42, the former being connected to said shaft at its upper end and at its lower portion having a slot which engages a pin or stud 43 on the upper end portion of the lever 42. The latter is pivoted at 44 to the frame and has a slot 45 at its lower portion which engages a pin or stud 46 on the bar 36. Said shafts 31 31ª are also connected by the link 31ᵇ. It will appear, therefore, that when the machine is in operation the shafts 31 31ª will be periodically rocked to thereby actuate the valves 30 to control the discharge from the acid-cups 28. The upper stretches of the chain are supported by a floor or table 47, over which they pass.

48 designates adjustable bars located one at each end of the machine and which extend transversely over the chains. These bars are for the purpose of removing the work from the chains by impingement against the prongs or shanks of the articles. The articles so removed may fall into a receptacle of any kind, which may or may not be filled with water or other suitable liquid.

In operation the prongs, nails, or shanks B, Figs. 4, 5, and 6, are first inserted through suitable backing-pieces C and are then inserted in the cup-shaped heads D, pieces of solder being also placed thereon in the cups. The articles are then fed by hand onto the carrier-chains by placing them in the cups or receptacles *b* thereof.

Two feeders are usually employed for each chain. The movement of the chains carries the articles forward into the ovens, before entering which each article receives a discharge of acid from one of the cups 28. In passing through the ovens the operation of soldering is completed.

On both ends of the machine at each side there is placed a shelf or table 50, having an upturned lip or flange 51. These shelves or tables are for the convenience of the operators in feeding the articles to the carriers.

It will be obvious that modifications of the machine as above described may be made without departing from the spirit and scope of my invention, and I do not therefore limit myself to the particular embodiment of the invention herein shown and described.

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

1. In a machine of the character described, an endless chain or carrier composed of end-jointed links, and small shallow cups secured to the side bars of said links and projecting laterally thereof, together with means for supporting and actuating said carrier, substantially as specified.

2. In a machine of the character described, an endless chain or carrier composed of end-jointed links, and small shallow cups secured to the side bars of said links and projecting laterally therefrom, together with gearing for imparting an intermittent step-by-step movement to said carrier, substantially as specified.

3. In a machine of the character described, a pair of endless carriers arranged side by side, driving-gear for moving said carriers intermittently and in opposite directions, and small shallow cups secured to the links of both carriers and extending laterally thereof, substantially as specified.

4. In a machine of the character described, the combination with a carrier-chain having laterally-arranged cups or receptacles for the articles to be carried, gearing for driving the same, and a soldering-oven through which the chain passes, of acid-cups having discharges adjacent to the path of movement of the said cups or receptacles, valves for controlling the said discharges, and connections between the said valves and a moving part of the gearing for controlling said valves, substantially as specified.

5. In a machine of the class described, the combination with a carrier-chain and its gearing, of an acid-cup, a valve controlling the discharge from said cup, a rock-shaft, a connection between said shaft and the stem of

said valve, and a connection between said shaft and a moving part of the gearing, substantially as specified.

6. In a machine of the class described, the combination with a carrier-chain and its gearing, of an acid-cup, a valve for controlling the discharge from said cup, a rock-shaft, a connection between the said shaft and the stem of said valve, an eccentric mounted on a shaft of said gearing, a yoke engaging said eccentric, and a connection between the said yoke and the said rock-shaft, substantially as specified.

7. In a machine of the character described, an endless carrier-chain, sprocket-gears which carry the said chain, a driving-shaft, a ratchet-wheel mounted on the same shaft with one of said sprocket-gears, a bar fulcrumed at one end on the ratchet-wheel shaft, and at its other end portion loosely engaging a crank of the driving-shaft, and a pawl carried by said bar and engaging the teeth of said ratchet-wheel, substantially as specified.

8. In a machine of the character described, the combination of a driving-shaft, an adjacent parallel shaft, a third shaft at the opposite end portion of the machine, the two loosely-mounted sprocket-wheels on said third shaft, each of which has an attached bevel gear-wheel, a bevel-toothed pinion engaging both said gear-wheels, two sprocket-wheels on said parallel shaft, the one fixed thereto and the other loosely mounted thereon, the two carrier-chains carried by the respective pairs of sprocket-wheels, and a connection between said parallel shaft and the driving-shaft whereby the former has an intermittent motion in operation, substantially as specified.

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

ERNEST F. PFLUEGER.

Witnesses:
T. W. WAKEMAN,
H. D. HOSKIN.