(No Model.) 2 Sheets—Sheet 1.

C. W. SHEDD.

SOLDERING IRON.

No. 428,532. Patented May 20, 1890.

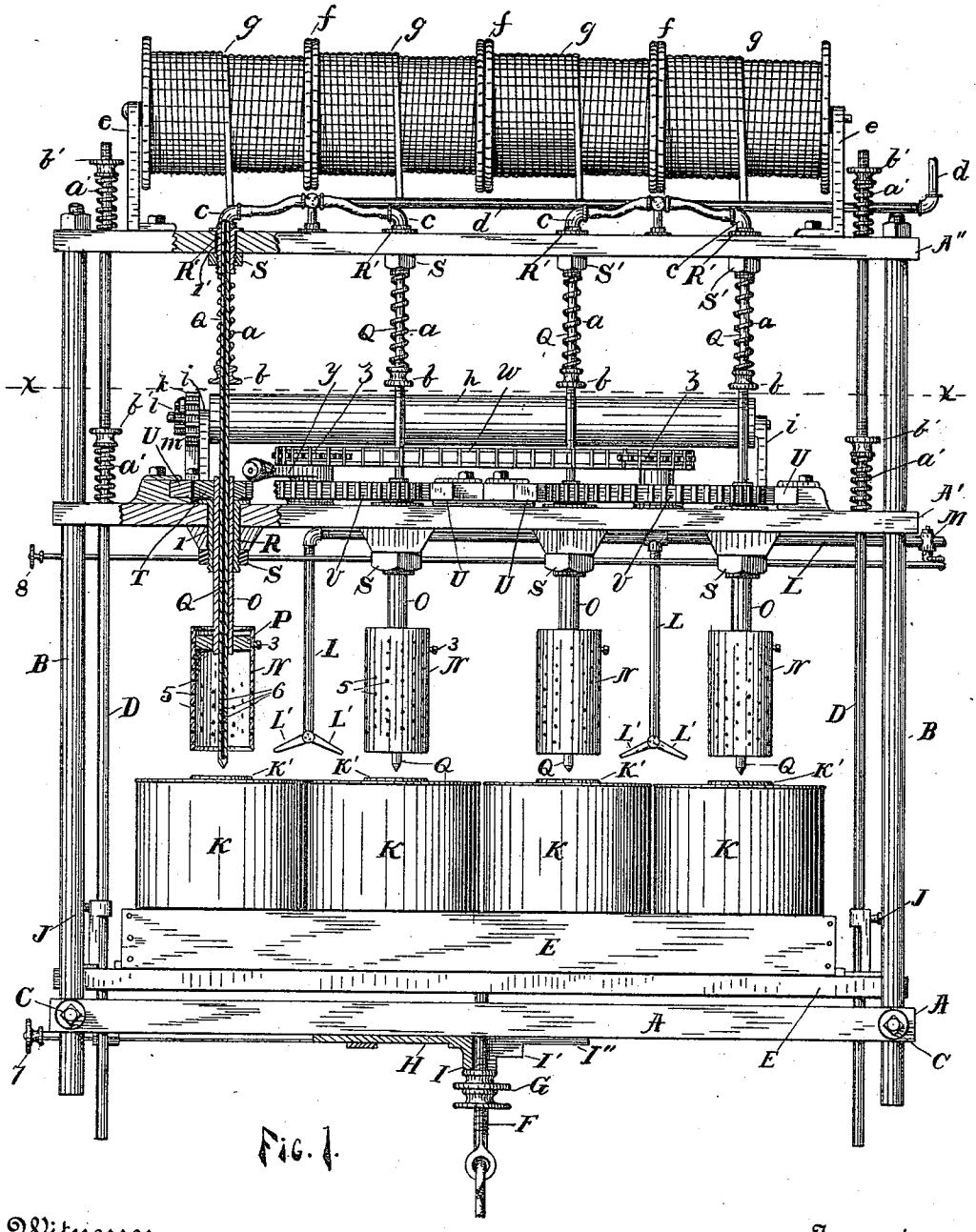

Fig. 1.

Witnesses

Harry P. Van Wagner

Hugh C. Wilson

Inventor

Charles W. Shedd

By his Attorney

Edward Taggart

(No Model.)

2 Sheets—Sheet 2.

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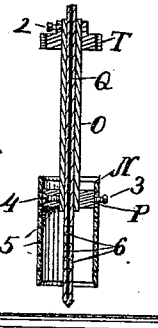

Fig. 4.

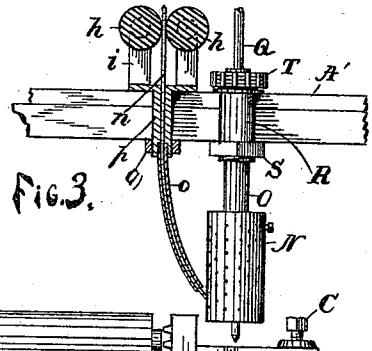

Fig. 3.

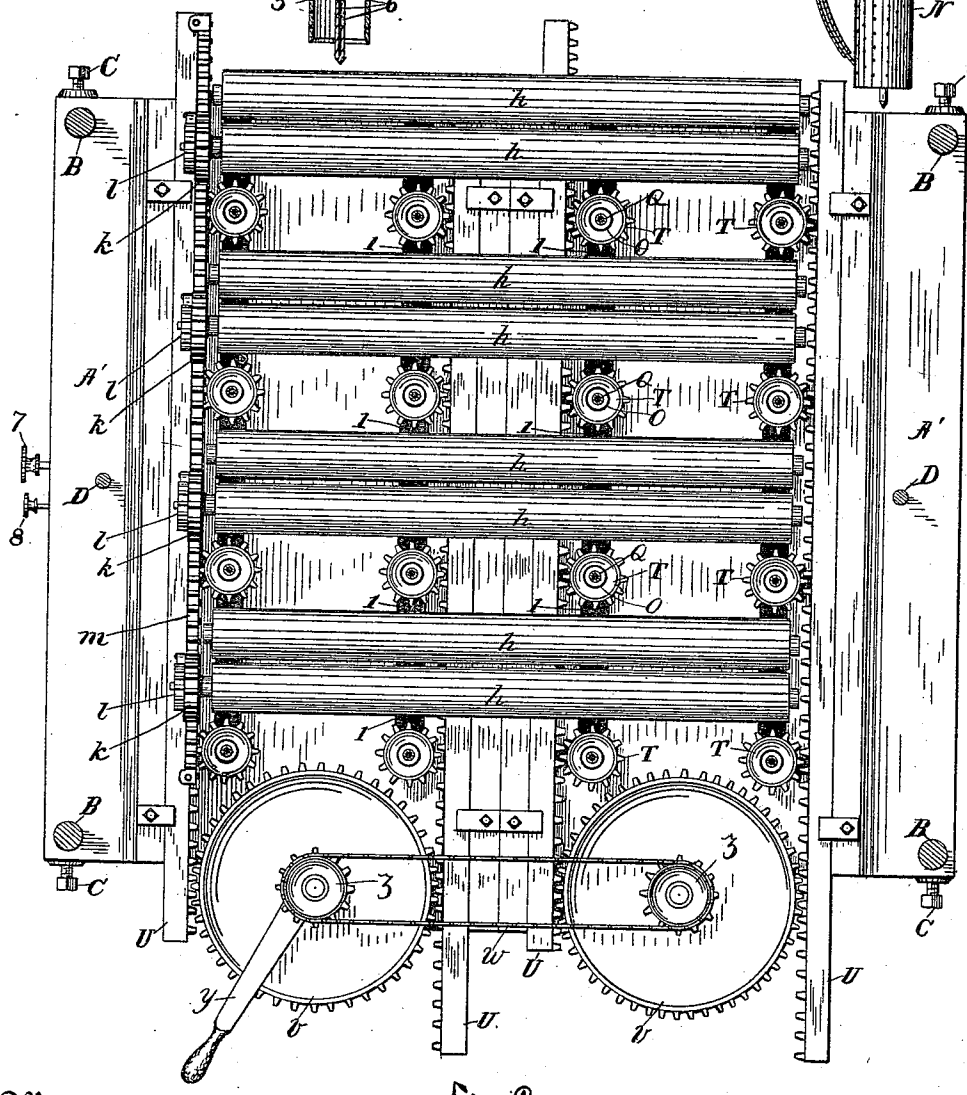

Fig. 2.

Witnesses

Harry P. Van Wagner

Hugh C. Wilson

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By his Attorney

Edward Taggart

UNITED STATES PATENT OFFICE.

CHARLES W. SHEDD, OF GRAND RAPIDS, MICHIGAN.

SOLDERING-IRON.

SPECIFICATION forming part of Letters Patent No. 428,532, dated May 20, 1890.

Application filed September 21, 1889. Serial No. 324,608. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. SHEDD, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Soldering-Irons, of which the following is a specification.

This invention relates to a machine supporting a series of soldering-irons designed to be used for the purpose of soldering the caps of tin cans, and also relating to the peculiar construction of the soldering-irons, the objects of the invention being, first, to arrange a series of soldering-irons by suitable mechanism so that a number of cans may be operated upon at once, and, second, to construct the soldering-iron with openings through its cylindrical walls, thereby supplying a sufficient quantity of oxygen to the gas-jet while soldering, which jet is placed within the cylindrical soldering-iron. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of my device for operating upon several cans at once, showing also one of the soldering-irons and attachment in section. Fig. 2 is a plan view of the same with the parts above the line x x in Fig. 1 removed in order to show more fully the operating parts of my device. Fig. 3 is a detached view showing the mechanism for feeding the soldering-wire to the soldering-iron; and Fig. 4 is a sectional view of the soldering-iron and the parts immediately attached thereto, showing a modified form of the soldering-iron.

Similar letters and figures refer to similar parts throughout the several views.

The machine as illustrated in the drawings shows three parallel plates.

A is the bottom plate, A′ the middle plate, and A^2 the top plate. Four posts—one at each corner—support the three plates. These posts are shown in the drawings by B B.

C C are set-screws for the purpose of adjusting the plate at any required position upon the posts.

D D are rods attached to the elevator E′ and passing downward through plate A and upward through plates A′ and A^2, through which plates they have free movement. These rods are each provided with springs a' a', &c., and also adjusting-nuts b' b', &c. The springs are compressed between the plates through which the rods pass, the nuts having a tendency to raise the elevator and tray of cans.

J J are nuts for adjusting the elevator E′ to any required position upon the sliding rods D D, &c.

E is a tray which slides into the elevator or rests upon the elevator E′ and is designed to hold the series of cans K K, &c.

F is a rod attached to the elevator and connected with a treadle for the purpose of depressing the elevator and with it the cans, which depression is against the pressure of the springs a' a', &c. The rod F is provided with an adjustable nut G, and also a sliding washer H, which washer H is adapted to move in a slot or groove in the plate A. The washer H is provided with shoulders or offsets. (Shown by I, I′, and I^2.) The object of these shoulders or offsets is to adjust the cans in three separate positions with reference to the soldering-irons. When the adjustable nut G rests against the shoulder I, there is a space between the soldering-irons and the cans, as shown in Fig. 1, such space being sufficient to allow for the removal and replacement of the tray of cans upon the elevator. When the adjustable nut G rests against the shoulder I′, the cap-holders Q Q Q rest upon the caps of the cans, but the irons do not touch the cans. When the nut G rests against the shoulder I^2, the soldering-irons are in contact with the caps or covers of the cans and in position to melt the solder and attach the caps. The adjustment of the washer H is effected by moving the same from the position shown in Fig. 1 to the left, so that the washer may rest against the shoulder I′ or I^2. The shoulder may be made on either side of the washer or may entirely surround it; but the washer is moved laterally so as to allow the adjusting-nut to rest against either shoulder as required.

The tops or covers of the cans to be operated upon are shown by K′ K′, &c. In soldering the cans the tray is raised until the soldering-irons come in contact with the cans.

The solder is fed as hereinafter described, and the soldering-irons, which are shown by N N N, are rocked or partially rotated, as more fully described hereinafter.

L is a pipe with dividing-branches connecting with an air bellows or reservoir for the purpose of cooling off the soldered cans after they have been operated upon by the soldering-irons. The pipe L in the illustration of my invention shown in the drawings is provided with branches L′ L′, extending to a point not far from the lower ends of the soldering-irons. The air bellows or reservoir is operated by a valve M, which is operated—that is, opened and closed—by means of the valve-rod 8.

N N represent the soldering cylinders or tubes, which tubes are provided with a series of air-openings. (Shown by 5.) The tubes N are reversible, so that when one end is worn or injured the same may be reversed or turned end for end, and tubes of varying sizes may be used to fit caps of various sizes.

O is a hollow shaft carrying a head P, to which head the soldering-cylinder N is attached. In the drawings I have shown the attachment by means of a set-screw 3. This allows for the vertical adjustment of the soldering-irons.

In Fig. 4 I have shown another adjustment, (shown by 4,) which adjusts the head upon the shaft O. The shaft O is hollow, and passing through it lengthwise is the burner-tube Q, which furnishes the gas which heats the cylinder, the gas passing out of the lateral holes or perforations 6. The lower end of the tube Q forms the device which holds the caps firmly and centers the soldering-iron already referred to.

R R are sleeves for the shaft O O, which sleeves R R are adjusted in the frame A′, and R′ R′, &c., are sleeves in the upper plate, through which the gas-tubes Q Q pass, and these sleeves are adjusted laterally in said plate A′, such adjustment enabling the operator to move the soldering-irons to and from each other.

S is a lock-nut designed for fastening the sleeves R in any required position in the slot in plate A′, and S′ is a lock-nut for fastening the sleeves R′ in any required position in the slot. It will be observed that the nuts S and S′ are placed one directly above the other, and that each soldering-iron and its attachment is provided with a nut S and S′.

T are pinions—one upon each shaft O—which pinions are preferably attached in a way to be adjusted longitudinally upon the shaft. The number of pinions corresponds to the number of soldering-irons, and each row of pinions engages with a rack U, there being one rack for each row of soldering-irons.

a is a spiral spring surrounding the tube Q, bearing against the nut S′ at the top and the adjustable nut *b* at the bottom, the object of the spring being to allow the lower point of Q to recede within the cylindrical soldering-iron when pressure shall have been applied. Each tube Q is provided with a spring *a*.

c is an elbow fastened to the gas-tube Q and connected to an elastic tube.

d is a gas-pipe which furnishes the gas through the elastic tubes to the gas-tubes Q, from whence it passes out through the small openings within the cylindrical soldering-irons, where it is lighted and heats the irons.

e e are two standards supporting a shaft, upon which shaft are the solder-spools *f f*. These solder-spools are provided with a solder-wire *g*, the wire passing between the feed-rolls *h h*, which feed-rolls are supported by an adjustable standard *i i*. The solder-wire *g* also passes through the sleeve P and the tube *o*, the lower end of the wire reaching the periphery of the soldering-iron.

q is a nut for adjusting the position of the tube *o*.

The peculiar construction and arrangement of the feed-rolls and feed-tube are shown in Fig. 3.

k k, &c., are loose pinions provided with a pawl or catch which engages with a pinion-rack on the fixed rollers *h′*, the same giving an intermittent motion to the feed-rolls *h h*.

m is a rack at the top of the rack-bar U, for the purpose of operating the feed-rolls, the same being integral with the rack-bar U, and the rack-bar U having teeth or cogs upon the top for operating the feed-rolls, and cogs on the side for operating the soldering-irons.

V V are large gears which have teeth which engage with the rack-bars U U, &c., and also provided with the sprocket-wheels 3 3.

w is a sprocket-chain connecting wheels 3 3 and causing them to move simultaneously.

Y is a handle or lever operating one of the wheels V.

7 is a push-rod for operating the sliding washer H.

The pinion T is adjustable upon the shaft O by means of the set-screws 2, the object of this adjustment being to compensate for and take up the wear of the burner-tube.

Instead of using trays for holding the cans in position to be soldered, the trays may be dispensed with and the cans placed upon the elevator in position to receive the soldering-irons; but in experience I have found it desirable to use the tray, though not absolutely necessary.

The operation of my invention is as follows: First fill the tray with cans and then lower the elevator by means of the rod F and lock it in the lower position in the manner shown above. The elevator having been previously adjusted by means of the nut G, the gas is admitted through the pipe D and the tubes Q Q and lighted and the soldering-iron heated to the required temperature. Now let the elevator and tray of cans rise by means of the spring, the upward movement being regulated by the treadle, the cap holder or burner first touching the caps and holding them

firmly in position, slide the washer H until the nut G rests against the shoulders I^2, and the cylinders are now in contact with the caps. By means of the handle Y move the racks U U U backward and forward, giving a rocking motion to all the series of soldering-irons. This rocking motion at the same time lowers the solder-wire in the manner hereinbefore described, supplying a sufficient quantity of solder to solder the cap to the can its entire circumference. When the caps are sufficiently soldered, lower the elevator until the caps are clear of the irons, but the burner-tubes are holding the caps, and introduce a blast of air through the tube L L and cool off the cans. This operation is repeated with each set of cans.

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

1. The combination, with the shaft O and the disk-head P, carried thereby, of the reversible cylindrical soldering-iron having each end formed for soldering and one of said ends extending over, inclosing, and secured to the periphery of the disk-head, substantially as described.

2. The combination, with the shaft O and the disk-head P, carried thereby, of the reversible cylindrical soldering-iron having each end formed for soldering and one of said ends extending over, inclosing, and vertically adjustable on the periphery of said disk-head, substantially as described.

3. The combination of the hollow supporting-shaft O, the disk-head P, secured thereon, the reversible cylindrical soldering-iron radially perforated, having each end formed for soldering and one end extending over and secured to the periphery of the disk-head, and a gas-burner tube extending through the hollow supporting-pipe and projecting through the soldering-iron, substantially as described.

4. The combination, with the shaft O and the head P, having a set-screw and adjustable along the length of the shaft, of a tubular soldering-iron formed with numerous radial perforations for the inlet of air to support combustion and secured to said adjustable head, and a burner-tube Q entering the soldering-iron and having openings 6, substantially as described.

5. The combination, with the hollow shaft O and the disk-head P, secured thereon, of the reversible radially-perforated soldering-iron formed at each end for soldering and having one end extending over, inclosing, and slidable on the periphery of the disk-head, a device for holding the reversible iron in its adjusted position on the disk-head, and a gas-burner tube extending through the hollow pipe into the reversible iron and provided with radial perforations 6, substantially as described.

6. The combination, with a rotating soldering-iron, a shaft for the same, and mechanism for rotating the shaft, of the wire-guide and wire-feed rolls, one having a pinion which is driven by a part of the mechanism which rotates the soldering-iron shafts, substantially as described.

7. The combination of rotating soldering-irons, shafts carrying the same and provided with pinions, the soldering-wire guide, the feed-rolls having pinions, and reciprocating racks which rotate the soldering-irons and feed-rolls, substantially as described.

8. The combination, with a soldering-iron, of the solder-wire-feed rolls, pinion-and-ratchet mechanism which imparts a step-by-step motion to one of the feed-rolls, and a pendent wire-guide placed between the feed-rolls and the soldering-iron for supporting and guiding the solder-wire to the lower end of the iron, substantially as described.

9. The combination, with a soldering-iron, of the wire-feed rolls having pinions and ratchet and a rack-bar for imparting a step-by-step motion to the feed-rolls, and a pendent wire-guide between the feed-rolls and soldering-iron for supporting and guiding the solder-wire to the lower end of the iron, substantially as described.

10. The combination of a series of vertically-sliding rods D, a can-carrying tray E, secured to and rising and falling with the rods, a series of pendent soldering-irons N, means for moving the tray downward from the irons, and springs on the rods for raising the tray and moving the cans into contact with the lower ends of the soldering-iron, substantially as described.

11. The combination of a series of vertically sliding rods D, a series of pendent soldering-irons N, a can-carrying tray E, secured to and rising and falling with the rods below the soldering-irons, a rod F, secured to the under side of the tray for drawing the tray downward away from the soldering-irons, and springs acting on the rods to raise the tray and move the cans into contact with the pendent soldering-irons, substantially as described.

12. In combination with the carrier, a depressing-rod F, a slotted washer H, having shoulders I, I′, and I^2, and a nut G, said washer adapted to move laterally in order to bring the nut in contact with the shoulders, respectively, substantially as described.

13. The combination of a series of pendent vertically spring-yielding soldering-irons with the can-carrying tray below the irons, the vertically-sliding rods having springs which raise the tray and move the cans into contact with the soldering-irons, and means for lowering the tray away from the soldering-irons, substantially as described.

14. The combination of the slotted lower and upper plates A A^2, the soldering-irons N, the sleeves R, adjustable in the lower slotted plate, the sleeves R′, movable in the upper slotted plate, the gas-burner tubes Q, passing through the upper and lower sleeves and enter-

ing the soldering-iron, and elastic tubes connected with the burner-tubes, substantially as described.

15. The combination of a pair of gear-wheels V, each having its shaft provided with a sprocket-wheel 3, a sprocket-chain W, connecting the separate wheels, and a lever *y* for oscillating one of the gear-wheels with two pairs of independently-moving rack-bars U, each pair engaging a gear-wheel, the soldering-irons, and the shafts carrying the irons and provided with pinions, substantially as described.

16. The combination, with a series of cylindrical soldering-irons, of a series of hollow shafts supporting the same, a series of pinions on the shafts, a rack-bar having two sets of cogs, one set adapted to rock the shafts which support the irons, and the other set adapted to operate the pinions which operate the feed-rolls, pinions having an intermittent movement in one direction only, feed-rollers operated by such pinions, and a guide directing the soldering-wire to the irons, all substantially as described.

17. The combination of a rotating gear-wheel V and a pair of disconnected rack-bars U, respectively engaging opposite sides of the gear-wheel, and by the latter reciprocated in opposite directions, with the soldering-irons and the shafts carrying the irons and provided with pinions located between and engaging the rack-bars, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

CHARLES W. SHEDD. [L. S.]

Witnesses:

EDWARD TAGGART,

HARRY P. VAN WAGNER.