(No Model.) 3 Sheets—Sheet 1.

D. M. MONROE.

CAN SOLDERING MACHINE.

No. 337,277. Patented Mar. 2, 1886.

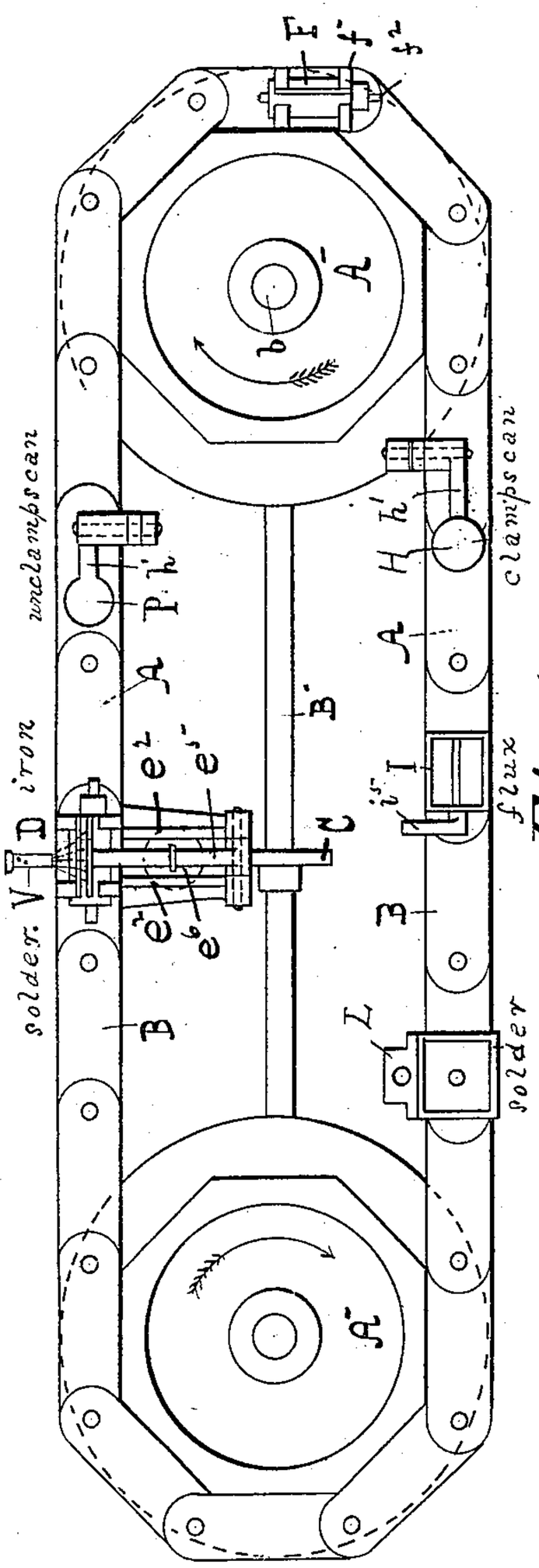

Fig. 1.

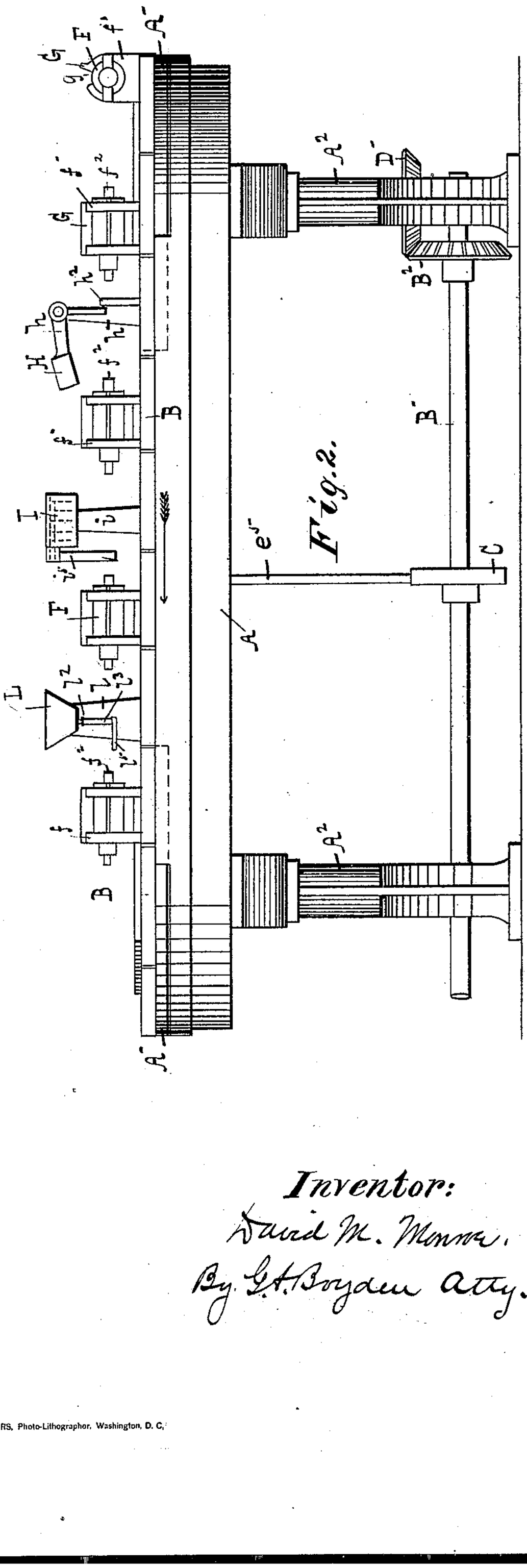

Fig. 2.

Witnesses:
Wilson Ringle
G. T. Boyden.

Inventor:
David M. Monroe.
By G. T. Boyden Atty.

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D. M. MONROE.

CAN SOLDERING MACHINE.

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Fig. 5.

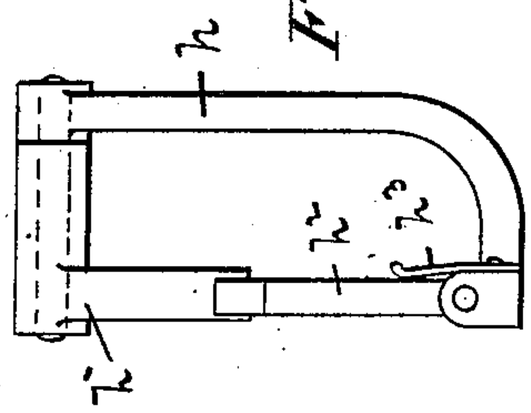


Fig. 9.

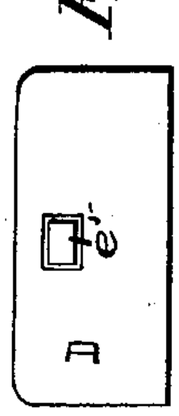


Fig. 10.

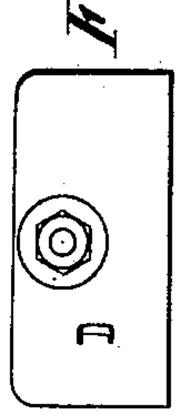


Fig. 11.

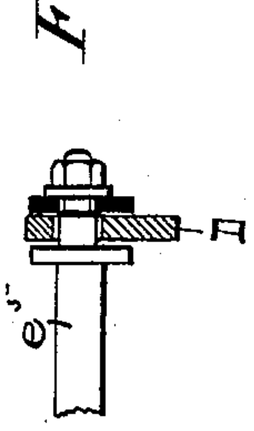


Fig. 4.

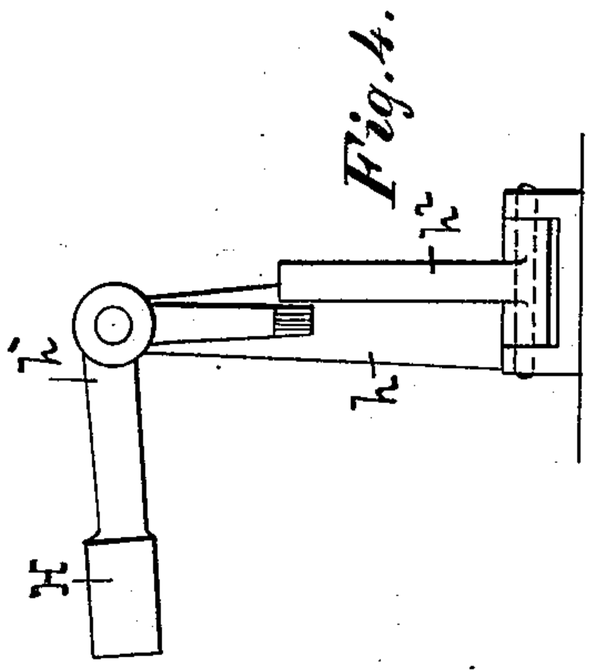


Fig. 8.

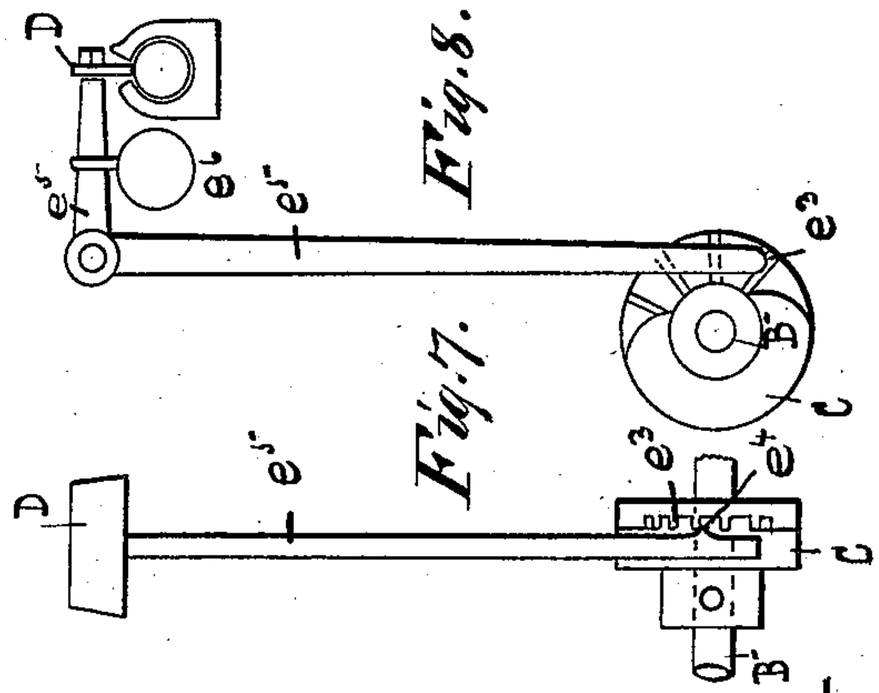


Fig. 7.

Fig. 3.

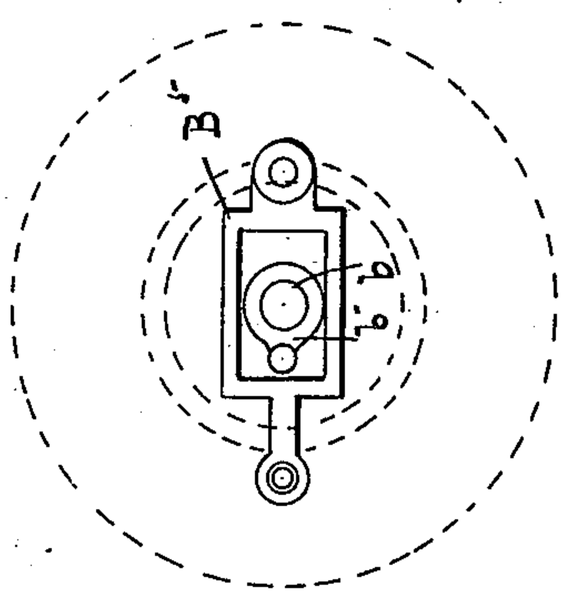


Fig. 6.

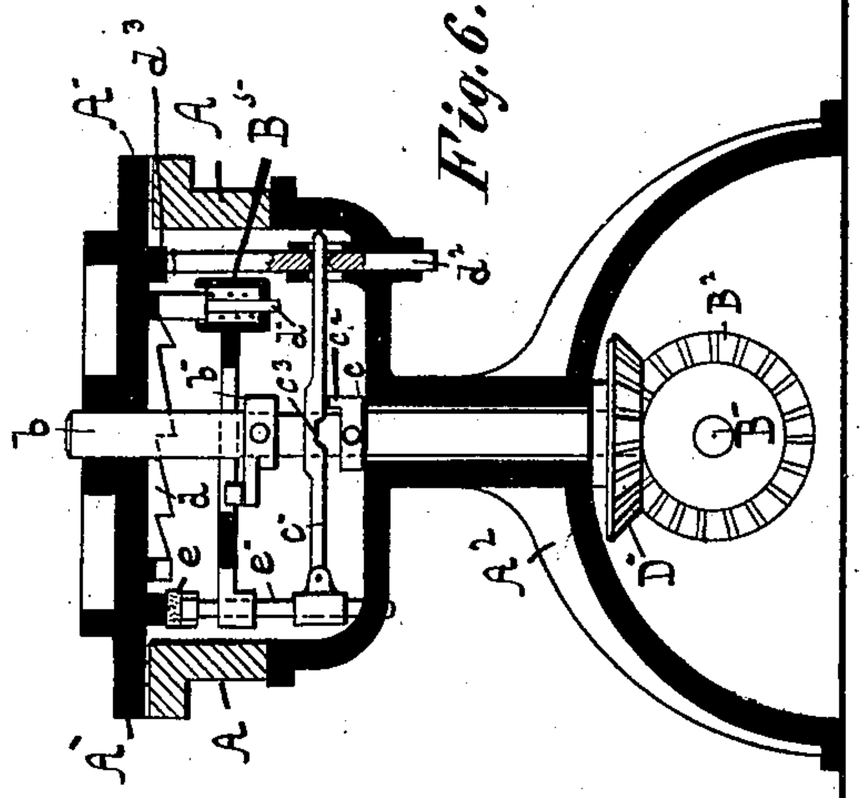
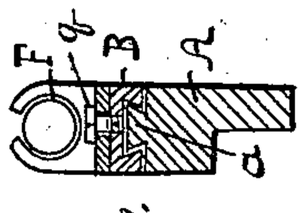


Fig. 19.



Witnesses:

Wilson Ringle -

D. G. Boyden.

Inventor:

David M. Monroe.

By G. A. Boyden atty.

(No Model.) 3 Sheets—Sheet 3.

D. M. MONROE.

CAN SOLDERING MACHINE.

No. 337,277. Patented Mar. 2, 1886.

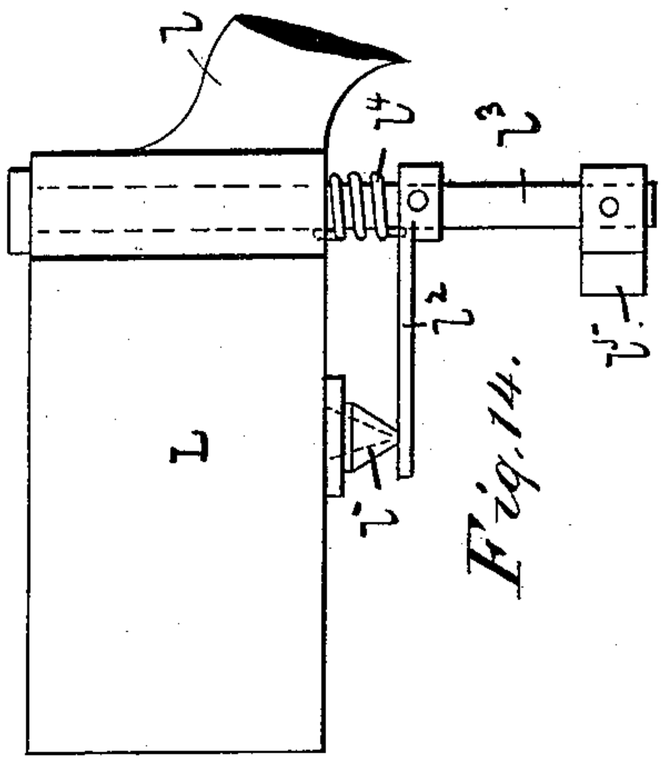


Fig. 14.

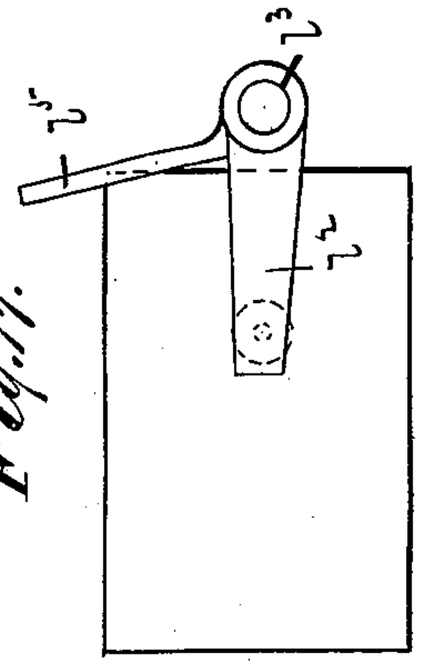


Fig. 17.

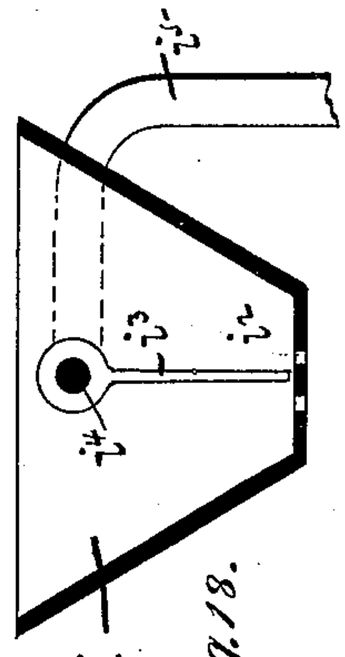


Fig. 18.

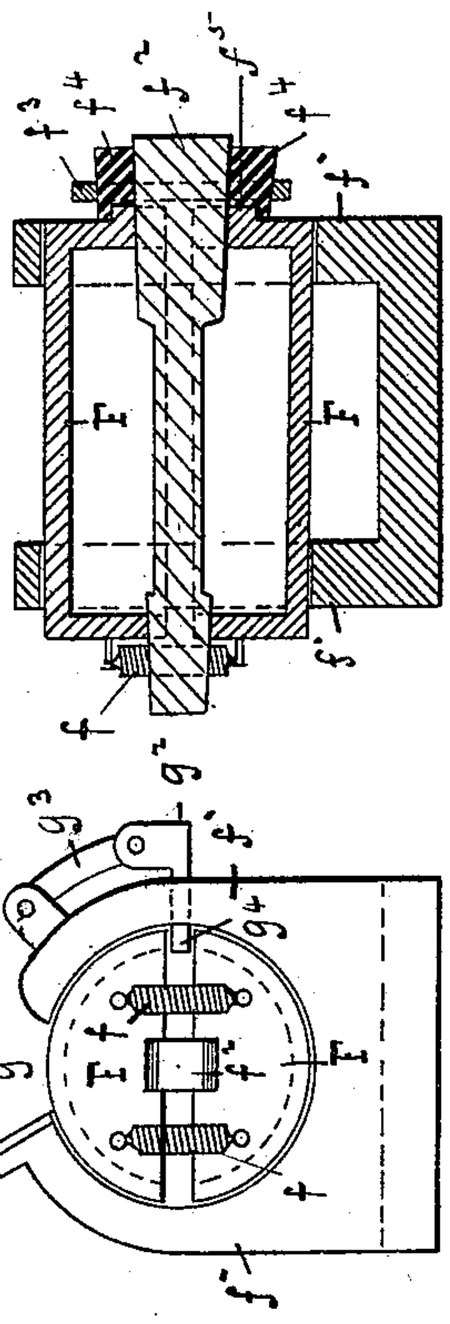


Fig. 13.

Fig. 12.

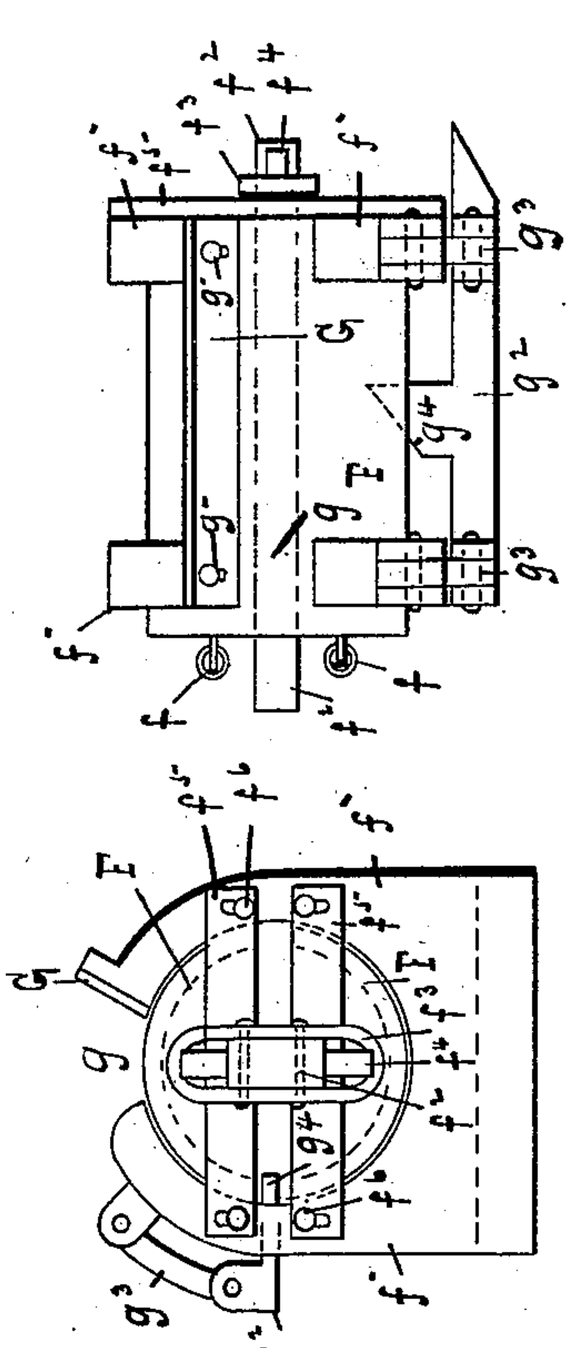


Fig. 16.

Fig. 15.

Witnesses:

Wilson Ringle

G. H. Boyden.

Inventor:

David M. Monroe,

By G. H. Boyden Atty.

UNITED STATES PATENT OFFICE.

DAVID M. MONROE, OF BALTIMORE, MARYLAND.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 337,277, dated March 2, 1886.

Application filed December 3, 1885. Serial No. 184,642. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. MONROE, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Can-Soldering Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in can-soldering machines in which the body or side seam of sheet-metal cans are soldered, as illustrated in the accompanying drawings, in which—

Figure 1 is a top view. Fig. 2 is a side view. Fig. 3 is a detail view of the link to operate the chain-supporting wheel. Figs. 4 and 5 are detail views of the weight mechanism by which the gaging device is operated. Fig. 6 is a vertical cross-section view, showing the intermittent mechanism. Figs. 7 and 8 are detail views of the mechanism that operates the soldering-iron; Fig. 9, a side view of the soldering-iron with the holding-nut removed; Fig. 10, a side view of the soldering-iron with the nut on; Fig. 11, a sectional view of the soldering-iron; Fig. 12, a rear view of the gaging device; Fig. 13, a sectional view of the gaging device. Fig. 14 is a side view of the solder-receptacle; Fig. 15, a front view of the gaging device. Fig. 16 is a top view of the gaging device. Fig. 17 is a top view of the cut-off to the solder-receptacle. Fig. 18 is a sectional view of the fluxing device; Fig. 19, a cross-section of the frame, a gaging device, and a link.

Similar letters refer to similar parts throughout the several views.

The letter A designates the frame, which is constructed with two parallel dovetail guide-ways, *a*, on which the chain, consisting of the links B, travels, and which are cut away at both ends of the frame to permit the wheels A′, one of which is placed at each end of the machine, to rotate, and the chain to pass around the same, the frame being supported on the legs A^2 and secured thereto in any suitable manner. The machine is driven from the shaft B′, which is either supported on bearings attached to the legs A^2 or secured to the floor, as may be desired. In this instance it forms the line-shafting, and it is provided with the pinion B^2, which gears with the one, D′, on the vertical shaft *b*, and the cam C, which actuates the soldering-iron D. The chain has imparted thereto an intermittent movement from the revolving shaft *b*. The said shaft is provided with the crank *b′*, which contains a roller on its outer end that engages with either side of the link B^5 alternately as the shaft *b* rotates, thereby moving the link either way by an eighth-revolution of the shaft *b*. When the link B^5, which is pivoted to the rod *e′*, is moved to one side, the spring-pawl *d′* engages with one of the ratchet-teeth *d*, and the link remains in that position while the shaft *b* is making nearly one-half of its revolution, or until the roller on the crank *b′* comes in contact with the opposite side of the link, which is then moved back by one-eighth of a revolution of the shaft *b*, and the wheel A′ and chain likewise moved, thereby imparting to the same an intermittent movement that permits them to remain stationary about seven-eighths of the revolution of the shaft *b* and moved by one-eighth of the same. Just previous to the movement of the wheel A the projection c^2 on the collar *c* enters the notch c^3, which permits the free end of the lever *c′* to drop, and with it the latch d^2, thereby withdrawing its upper end from one of the notches *d*, and permitting the wheel A′ to be turned by the movement of the link B^5, which then takes place. The projection c^2 in the meantime, as the wheel and link are being moved by the one-eighth revolution of the shaft *b*, moves in the notch c^3, the length of which is sufficient to keep the latch d^2 down until the wheel A′ has just stopped moving, when the projection c^3 raises the lever *c′* and likewise the latch d^2, which enter the notch following the one previously occupied, and thereby securely hold the wheel A′ and chain from moving until the link B^5 is again in position to operate them.

To prevent the chain and wheel A′ from jumping forward when they are first put in motion, and to insure a steady movement of the same while in motion, I arrange the brake-block *e* to bear against the cylindrical projection d^3, by having it secured to the rod *e′* in any suitable manner.

In the operation of the above-described

mechanism the link B^5 is moved to one side by the one-eighth revolution of the crank b', which places the spring-pawl d' in position to engage with one of the ratchet-teeth, after which the link remains stationary until the crank moves from one side to the other, which then brings the roller in contact with the opposite side of the link, and as it continues to turn moves the wheel A and chain. By this arrangement the wheel A and chain are moved forward by one-eighth of the revolution of the shaft b, and permitted to remain stationary the balance of the revolution.

The wheels A′ are in this instance constructed with a horizontal flange, on which is arranged a projection having eight sides, which is so constructed that the links B of the chain will lie thereagainst as the wheels rotate and and thus draw the chain around therewith, which, as the wheel intermittently rotates, will impart an intermittent movement to the chain, permitting the soldering-iron D to be applied to the can when the chain is stationary and the flux and solder when in motion.

The chain consists of a series of like links, B, attached together by a suitable joint, with a dovetail slot cut longitudinally in the under surface, and to correspond to the guideway a, on which they pass from the wheels and by which they are held in a right line when moving between the said wheels, thereby permitting the solder and flux to be accurately applied on the seams of the can-bodies as they pass under the appliances, and likewise the soldering-iron applied when the chain is stationary.

The device by which the can-bodies are sized and held while applying the solder, flux, soldering-iron, &c., consists, as detailed in Figs. 12, 13, 15, and 16, of an expanding-cylinder, F, made in two parts which are forced out against the bored standards f' by the wedge f^2 and drawn together by the springs f on one end, and at the other by the yoke f^3 coming in contact with the incline f^4 when the wedge is sufficiently withdrawn. The two portions of the cylinder are secured to the standards f' by the projection f^5, extending across the same and secured thereto by the screws f^6, but permitted to move by means of the slots in which the said screws pass. The cylinder being supported at one end, permits the can-bodies to be slipped on at the other, as there are no intervening parts between the standards and the cylinder. The upper part of the standards f' are cut away to form the opening g, at which place the overlapping seam is placed, and is thereby in a position to receive the solder, flux, and be soldered. To one side of the said opening is arranged the knife G, which is secured to both the standards f' by means of screws and slots g', which permit it to adjust itself to the can-body, and which is held thereagainst by means of springs arranged therefor in any suitable manner. The standards f' are bored out to correspond with the size of the head or end of the cans, thereby regulating the size of the body when forced against the standards to accurately fit the said heads, and are joined together by a suitable base-piece and secured to the links B of the chain by means of screws.

As shown in Fig. 19, the base of the standard f' rests on links B, and secured thereto by the screws q, which pass through the said base and threads into the links B, by which the gaging device can be removed and replaced by one of a different size, as may be desired, the links B being held to their place when on the frame A by means of a dovetail projection on the same, which fits the counter-form grooves in the links B.

As it is important in machines of this class to apply the solder, flux, &c., only when a can-body is on the device, on account of keeping the same free thereof, I arrange a device by which this is accomplished. It consists of a bar, g^2, swung to the standards f' by means of the links g^3, which permit it to be swung in and out, and it is provided with an incline projection, g^4, part of which extends into the cylinders when there is no can-body on the same, but when the said body is slipped on the cylinder its end comes in contact with the incline, which pushes and holds the bar g^2 out, which is then in a position to operate the solder and flux applying devices; but if the cylinder were minus a body the said bar would not project far enough out to operate the said devices. The cylinders are expanded by the wedge f^2, which is forced between the two parts of the cylinder by the falling of the weight H, which is attached to the bell-crank h' that is pivoted to the arm h, the latter being secured to the frame A. The weight is held up by the pivoted arm h^2, which is provided with the spring h^3 that holds it in its normal position, but permits it to be moved to one side, which is accomplished by the bar g^2 on the gaging device coming in contact therewith when a can-body is on the same, which moves it to one side, and as the weight H is held up by the short end of the bell-crank in contact with the pivoted arm the said weight is dropped when the arm is moved to one side, which in falling strikes the end of the wedge and forces it inward, and thereby expands and holds the can-body securely against the standards f'. The weight is elevated by the movement of the chain, which draws the gaging device against the weight as the movement continues, thereby automatically placing the weight in position to operate the following gaging device. The weight is held in that position by the arm h^2, the latter having an incline surface, which comes in contact with the short end of the bell-crank, and which is thereby moved to one side until the said bell-crank arm passes the pivoted arm, which then is sprung back to its normal position, and prevents the weight from falling until released.

The fluxing device I consists of a receptacle secured to the frame A by means of the arm i, and it is provided with a series of holes, i^2,

extending the entire length of the bottom. Directly over the said holes are suspended a number of corresponding arms, i^3, which are attached to the shaft i^4. It is arranged to be partly rotated by means of the arm i^5, which is secured to the end of the said shaft on the outside of the receptacle I, and extends back and downward, so that the bar g^2 on the gaging device will push it to one side as it passes by, and thereby operate the arms i^3 in unison therewith, which draws their ends across the holes i^2, and expels a small quantity of flux from each hole, which is deposited on the seam of the can-body, immediately under the same, the flux consisting of pulverized rosin. The solder-receptacle L is secured to the frame A rigidly by means of the arm l, and is provided with a nipple, l', which has a conical passage, the apex of which forms the ejecting-orifice, which is of a size to deposit the desired amount of solder on the can as it passes under the same. The cutting off and discharge of the solder is governed by the arm l^2 swinging under and from the nipple. The arm l^2 is attached to the rod l^3 that is secured to the receptacle, and is maintained in its closed position by the spring l^4, having one end attached to the solder-receptacle and the other to the arm l^2, and is operated by the bar g^2 on the gaging device coming in contact with the arm l^5, secured to the rod l^3, which moves it to one side, and therewith moves the arm l^2, forming the cut-off, from under the nipple, which permits solder to flow on the can-bodies as they pass beneath. The said solder is kept in a molten condition in the receptacle by means of suitable heat from burners or otherwise. The soldering-iron D is secured to the right-angle lever e^5, which is pivoted to the arms e^2, secured to the frame A, which, by means of the weight e^6 thereon, presses the iron D against the can-body when the lower end is released from the cam C at the proper time—*i. e.*, when the chain is stationary. A sidewise motion is imparted to the lever by the teeth e^3 on the side of the cam C coming in contact with the projection e^4 as it rotates, which slightly moves the soldering-iron to facilitate the distribution of the solder and firmly seat the said iron on the can-body, the joint at the pivoted point of the lever e^5 being sufficiently loose to permit the same. The soldering-iron D is secured to the short end of the lever e^5 by passing through a square hole therein, which is the counter form of the end of the lever. Thus any shaking of the lever is imparted to the iron, which at the same time has a slight rotary motion upon e^5, the washer and nut thereon being so arranged that the same is permitted, which allows the surface that comes in close contact with the can-body to adjust itself thereto. The releasing-weight P is constructed and operated the same as the one which forces the wedge inward, except that it operates vice versa thereto, after which the can is removed either by hand or by suitable mechanism.

By the herein-described mechanism the cans travel in a straight line, with the seam of the body in a parallel position thereto, thereby permitting the solder and flux to be distributed therealong while the chain is in motion, and the soldering-iron applied when stationary, which is heated by a hydrocarbon burner or burners placed to deliver their flame against the said iron before and while in contact with the can-body.

The mechanism herein set forth may be arranged in various ways and still retain the combinations of elements hereinafter claimed and produce the same result. Therefore I do not limit my invention to the exact form or arrangements shown.

The operation of the machine is as follows: The operator places the unseamed can-bodies, which are previously rolled on the cylinders at the end of the machine to the right, from which they pass to the weight H, which is then tripped and falls against the forward end of the wedge f^2, which forces it back and expands the cylinder and gages the can-body, which is held in that position, and as the chain continues on its course the weight is again lifted into position to operate on the device following the first-mentioned one. The cylinder then passes to the fluxing and solder-applying devices, when the same is applied, and then moves to the soldering-iron, which is then applied by the cam C releasing the lever e^5 and the soldering performed, from thence to the release-weight P, which falls and moves the wedge f^2 back and contracts the cylinder, which permits the body to be readily removed either by hand or by suitable mechanism. The chain, having an intermittent movement, stops each can-gaging device at the soldering-iron and remaining stationary while the same is applied, and the solder and flux are applied while the said chain is in motion, which, when the solder is applied, is distributed in a fine wire along the seam in the proper position thereto, ready to have the soldering-iron applied when it arrives at that point.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a can-soldering machine, the combination of an endless chain, the gaging device mounted on the chain, and means to expand the gaging device, whereby the body is gaged.

2. In a can-soldering machine, the combination of an endless chain, mechanism to impart an intermittent motion thereto, and the gaging device mounted on the chain, as set forth.

3. In a can-soldering machine, the combination of the endless chain, mechanism to impart thereto an intermittent motion, the gaging device mounted on the chain, and the soldering-iron D, for the purpose set forth.

4. In a can-soldering machine, the combination of the endless chain, means to impart thereto intermittent motion, gaging device mounted on the chain, and the solder-receptacle L.

5. In a can-soldering machine, the combination of the endless chain, mechanism to impart thereto an intermittent motion, a gaging device mounted on the chain, means to expand the gaging device, the flux-applying device, the solder-applying device, the soldering device, and means to contract the gaging device by which the soldered can is released.

6. In a can-soldering machine, the combination of the endless chain, mechanism to impart thereto intermittent motion, gaging device mounted on the chain, the solder-receptacle L, and the soldering-iron D, for the purpose set forth.

7. In combination with a can-soldering machine, an endless chain, the gaging devices mounted on the chain, and the fluxing device consisting of a receptacle for the flux, provided with a series of holes, i^2, and the arms i^3, arranged to move over the holes by which the flux is ejected.

8. In combination with a can-seaming machine, the endless chain provided with the gaging device, and the solder-applying device consisting of a receptacle for molten solder, and an ejecting-orifice provided with a cut-off by which the flow of solder is regulated.

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

DAVID M. MONROE.

Witnesses:

BENJ. BOYDEN,

JNO. T. MADDOX.