(No Model.) 3 Sheets—Sheet 1.

W. D. BROOKS.

Machine for Soldering Can Tops.

No. 236,484. **Patented Jan. 11, 1881.**

Fig. 1.

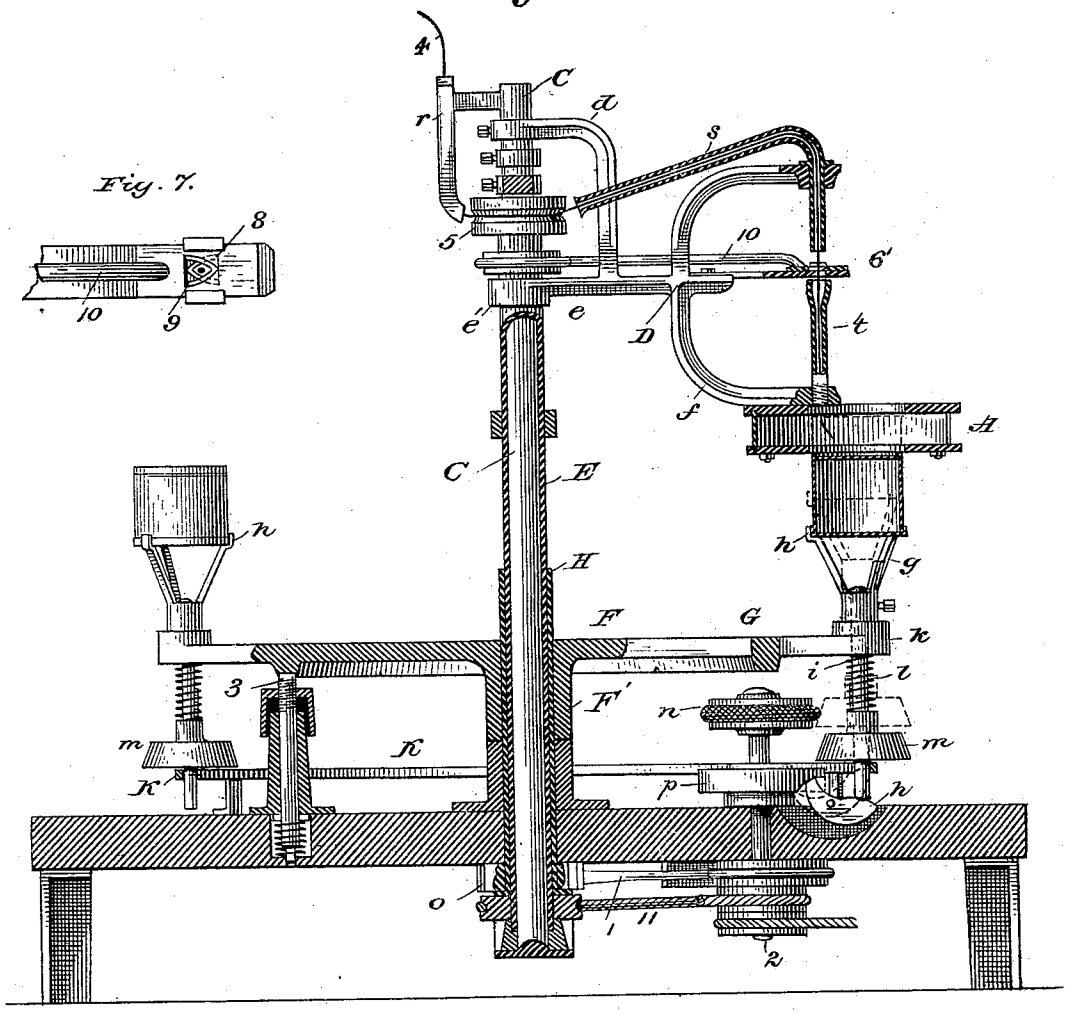
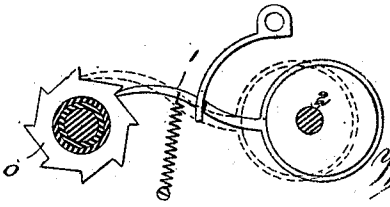


Fig. 7.

Fig. 2.



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Fig. 3.

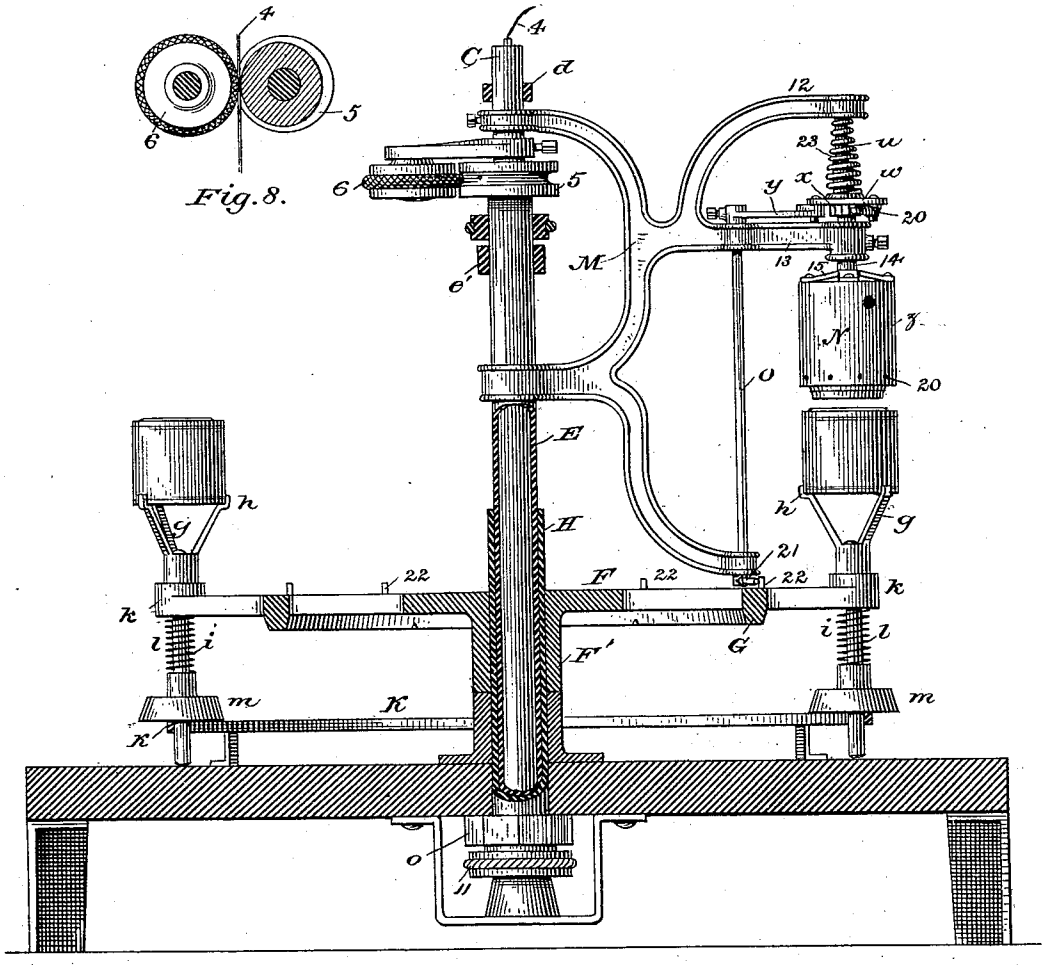
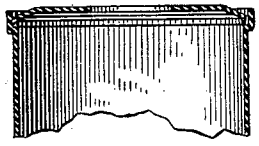


Fig. 8.

Fig. 6.



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(No Model.) 3 Sheets—Sheet 3.

W. D. BROOKS.

Machine for Soldering Can Tops.

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Fig. 4.

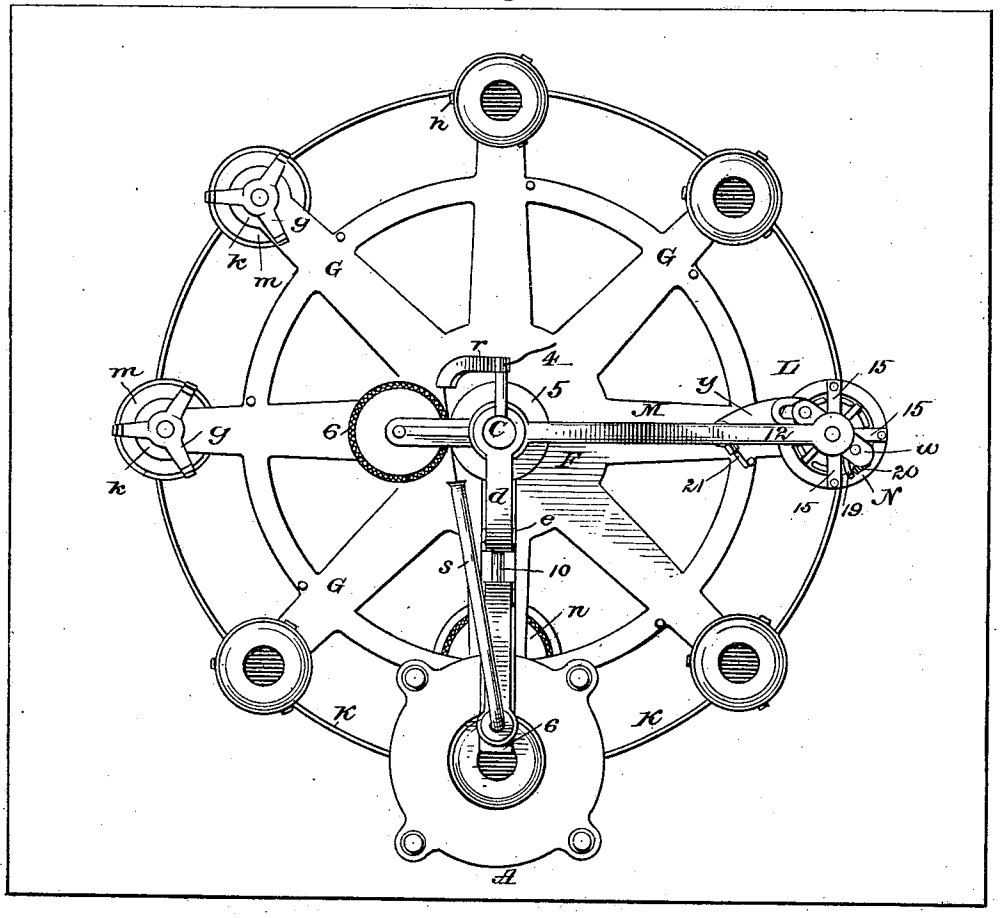
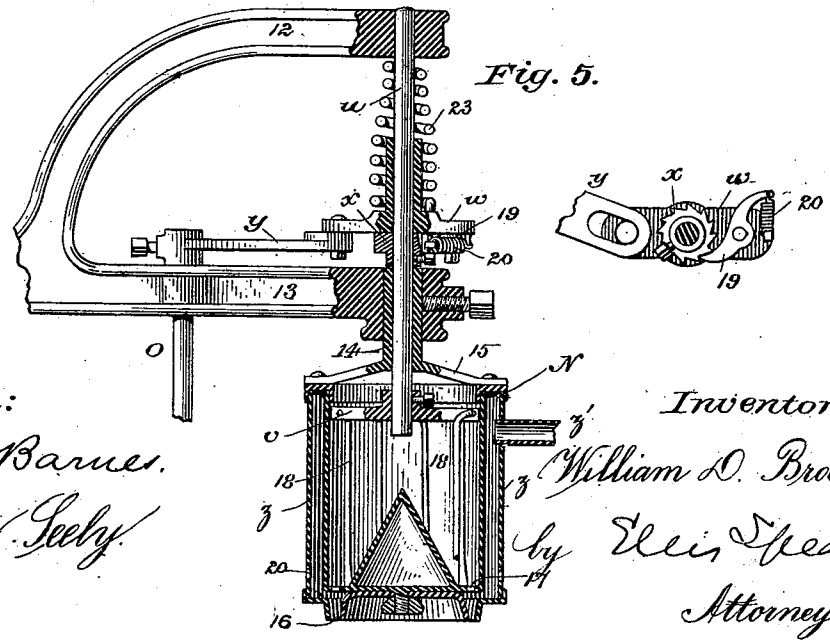


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM D. BROOKS, OF BALTIMORE, MD., ASSIGNOR TO HIMSELF, JOHN S. HULL, D. D. MALLORY, AND JONATHAN Q. RAND, OF SAME PLACE.

MACHINE FOR SOLDERING CAN-TOPS.

SPECIFICATION forming part of Letters Patent No. 236,484, dated January 11, 1881.

Application filed March 15, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. BROOKS, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and useful Improvement in Top-Soldering Machines for Cans; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to machines for soldering cans of that class in which the cans are held upon a revolving table and are brought in succession to the devices by means of which the solder is applied.

My improvements are designed more particularly for soldering the tops of cans.

They consist, first, in the combination, with movable can-seats, of devices for feeding solder-wire intermittently, a cutting-knife, and mechanism for operating such parts automatically in proper sequence; further, of devices for applying resin, of improved devices for rotating the cans and presenting them to the flame-chamber, and of other subordinate details, all of which are hereinafter explained, and particularly indicated in the claims.

In the drawings, Figure 1 represents my improved machine, partly in section and partly in side elevation. Fig. 2 represents the pawl and ratchet by means of which intermittent motion is imparted to the table. Fig. 3 shows a side elevation of the devices for applying the resin. Fig. 4 is a plan view of the machine. Fig. 5 is a central vertical section of the resin-box. Fig. 6 is an enlarged longitudinal central section of the upper part of a can with the top in place. Fig. 7 represents the cutting mechanism. Fig. 8 is a top view of the wheel and eccentric feeding-pulley.

In the apparatus shown the flame-chamber, which, in general form, is like those shown in application filed by me in the Patent Office on the 20th day of February, 1880, is supported on a central post, C, by means of a bracket, D. This bracket is provided with two arms, the upper of which, *d*, is held upon the upper end of the post by a set-screw. The lower arm, *e*, is supported upon the hollow shaft E by means of a ring, *e'*, in which the said shaft turns freely.

The flame-chamber A is fixed upon the lower branch, *f*, of the bracket D. It is specially adapted in construction to the soldering of the tops of cans, the opening in the bottom of the chamber being of a size just adapted to admit the can from below and permit it to turn freely therein. The upper opening may be a trifle smaller, and the can, when in place within the chamber, barely enters the opening and fits closely therein. When the can, therefore, is in position within the chamber its surface is exposed to the flame at the end and throughout its extent and circumference, and by the heat of this flame the solder laid upon the top of the can, near the edge, is readily melted.

F represents the revolving table, which in this case is composed of a central disk supported upon a short sleeve, F', and having radial arms G, which support the can-holding device. These can-holding devices consist of a spider, *g*, having fingers *h*, slightly offset to form a seat for the can. The foot of the spider is attached by a set-screw to the spindle *i*, which turns freely in the perforated boss *k* on the end of the arm G. The foot of the spider, when the can is lowered, rests upon the boss *k*, and the spring *l* tends to keep the spider depressed to its lowest position on the arm. The spindle *i* is rotated by means of a friction-wheel, *m*, on the lower end of the spindle *i*, which friction-wheel is impelled by contact with a second wheel, *n*, driven by band and pulley, as shown clearly in Fig. 1. These pulleys are so arranged that when the can is raised (as shown in dotted lines) so as to bring the upper end of the can into contact with the upper plate of the flame-chamber the friction-wheel *m* shall be in close contact with the friction-wheel *n*, at which time a complete revolution is imparted to the can by means of these two friction-pulleys. As soon as this revolution is completed the can-holder is permitted to drop, and this fall must be sufficient to allow the can to move clear of the flame-chamber. This movement laterally is accomplished by the step-by-step rotary movement of the table F, effected by means of the ratchet *o* on the hollow shaft H, to which the revolving table is fixed. This ratchet is driven by a pawl, 1, on the shaft 2 of the friction-wheel *n*, in the same manner as explained in my application hereinbefore referred to. The eccentric on the

shaft 2 is so arranged as to operate the pawl 1 at the exact moment when the revolution of the can has been completed and it has dropped clear from the flame-chamber. The movement is sufficient to carry the can quite aside from said chamber and to bring another exactly into place beneath the opening in said chamber.

In order to elevate the can-carrier into place within the flame-chamber, I have provided a pivoted lever, *h*. (Shown in Fig. 1.) The outer end of this comes directly under the lower end of the spindle *i* when the can is in line with the opening in the flame-chamber. The inner end of the lever *h* extends underneath the cam-faced pulley *p* fixed on the shaft 2. This pulley is so constructed and arranged that it holds the spindle *i* up with the friction-pulley *m* in contact with *n* and the can in its proper place within the flame-chamber until the can has received its proper amount of rotary movement, when it is permitted to drop, as hereinbefore explained. When it has thus dropped it is moved sidewise, and the can, when it reaches the attendant whose business it is to remove it, is sufficiently cool for removal.

As many radial arms G and can-carrying devices may be provided as can be conveniently used in the apparatus. Ordinarily ten or twelve will be found sufficient. The arms are held in place by means of a catch, 3, acting in notches in the under surface of the table, which catch yields freely when the ratchet *o* is operated by the pawl 1.

In Fig. 1 I have also shown devices for supplying solder to the cans. The solder is fed at first through a tube, *r*, in the top of which is a spring-clamp, which lightly grasps the wire 4, holding it steadily, but permitting it to be drawn down without too much resistance. From the lower end of the tube *r* the wire passes over the ground-face of a pulley, 5, which is fixed on the hollow shaft E. It is pressed against this pulley by a rubber-faced idle-wheel, 6, which keeps the wire forcibly in contact with the pulley 5, so that by the revolution of this pulley it is fed along through the bent tube *s* and through the opening in the knife-plate 6′ to the tube *t*, which is screwed into the arm *f*, from which last tube it drops upon the top of the can. The opening in the knife-plate 6′ is shown at 8 in dotted lines, being nearly triangular in form, with the cutting-edges slightly bent outward. The knife 9 has a similar opening and similar cutting-edges. It is so arranged upon the knife-plate that when pushed forward a clear space is left for the wire to pass through, as shown in Fig. 7. The knife is drawn back by a rod, 10, which passes around an eccentric fixed upon the hollow shaft E, and the parts are all so adjusted that the rod 10 is drawn back and the wire cut when a piece of sufficient length has been fed to the can. The motion imparted to the shaft E by the band 11 is uniform; but the wire is fed at proper intervals, which are regulated by a deeper groove cut at a proper point in the feed-pulley 5, the wire, when in the deeper part of the groove, not being pressed against the face, therefore remaining stationary. The parts must be so adjusted as to feed the wire when the can is underneath the tube *t*, and to cause the feed to cease when sufficient wire has been fed and the cutting devices are brought into operation. The circular guide-track *k* may be made in this case of a single rail, being simply required to steady the spindle *i* and to hold the pulley *m* securely against the pulley *n*.

The flame-chamber is made shallow, so as to allow the flame to impinge against only so much of the side of the can close to the end as shall be necessary to melt the solder. The top is formed, as is well understood, with a bevel, which forms an annular depression at the edge, into which the solder flows by gravity.

In order to supply the resin necessary for the adhesion of the solder, I have provided automatic mechanism. (Shown more clearly in Figs. 3 and 5.) This mechanism is supported upon a brace, M, on the central post, C. Upon the upper arms, 12 and 13, of this bracket is mounted a vertical shaft, *u*, which extends through the boss on the lower arm into a resin-box, N. This resin-box is cylindrical, and is attached to the lower arm by means of a central boss, 14, and radial arms 15, these radial arms leaving openings for the admission of the resin. The lower part of the box has a narrow annular opening, 16, exactly adapted to deposit the powdered resin in proper place around the edge of the top of the can. A false bottom, 17, above is finely perforated on a line just over the annular opening in the bottom. The shaft *u* extends down through the central boss, and carries arms *v* and stirrers 18, which move above the annular line of perforations. Motion is imparted to the shaft *u* and to the stirrers by means of a bar, *w*, carrying a pawl, 19, pressed by a spring, 20, against a ratchet, *x*, fixed on the shaft *u*. The end of the bar *w* opposite the pawl is provided with a pin working in a slot of the arm *y* on the shaft O. This shaft O is provided with a stud, 21, upon its lower end, which projects into the path of a pin, 22, on the radial arm G. These parts are so adapted to each other that when the can is brought exactly under the annular opening in the chamber of the resin-box the pin 22 strikes the stud 21, and, through the described mechanism, jars the stirring-arms within the box, thus shaking down the required amount of resin to its proper place on the head of the can. The spring 23 on the shaft *u*, fixed at the upper end to the arm of the bracket and at the lower to the bar *w*, returns the said bar to the position from which it was moved by the pin 22. By this device the resin is automatically applied to the can at the proper point at the table, and the can passes on to the point where the solder is applied.

In case it be necessary to keep the resin

cool, an outer jacket, *z*, is provided, which leaves an air-space around the resin-box, into which cool air is blown through a pipe, *z'*. Holes 20 are made near the bottom for the escape of the air.

I desire to disclaim the invention of the combination consisting of a device to feed solder-wire intermittently, a solder-cutting knife, a movable table provided with can-seats, and a connected mechanism to operate said parts, whereby each part is made to perform its function in proper sequence.

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

1. In a machine for soldering the tops of cans, a flame-chamber having an opening in the bottom for the admission of the can, in combination with a rotating can-carrier and devices for feeding the solder to the top of the can, as set forth.

2. The combination of the central shaft, the bracket supporting the flame-chamber, the pulleys and tubes for feeding the solder, and the flame-chamber, all as set forth.

3. In combination with the flame-chamber, the tubes for conducting the solder-wire, the feeding mechanism for said wire, and the cutting mechanism, all as set forth.

4. In combination with the tube which carries the wire, the fixed and movable knives, having the openings, as described, the movable knife being operated from an eccentric upon the shaft E, as described.

5. The combination, with the guiding-tube for the solder, of the yielding clamp, as and for the purpose set forth.

6. The combination of the spindle *i* of the can-holder, of the rotating pulleys, the lifting-levers, and the cam-faced wheel for operating the same, all as set forth.

7. In a machine for soldering cans, the combination of the can-holder, the shaft, the spring *l*, the friction-pulleys *m n*, the lever *h*, the eccentric *p*, and the driving-pulleys, substantially as set forth.

8. A device for applying resin to cans, consisting of a box to hold and deliver the resin, and agitators contained therein, in combination with the shaft O, operated by the can-carrying arms and connecting mechanism, substantially as described, for transmitting motion from said shaft O to the agitators.

9. In combination with the resin-box having perforations and stirrers, as described, the outer jacket, *z*, and supply-pipe *z'*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM D. BROOKS.

Witnesses:
L. W. SEELY,
C. N. ATWOOD.