(No Model.) 2 Sheets—Sheet 1.

W. M. EMMART.

CAN SOLDERING MACHINE.

No. 382,463. Patented May 8, 1888.

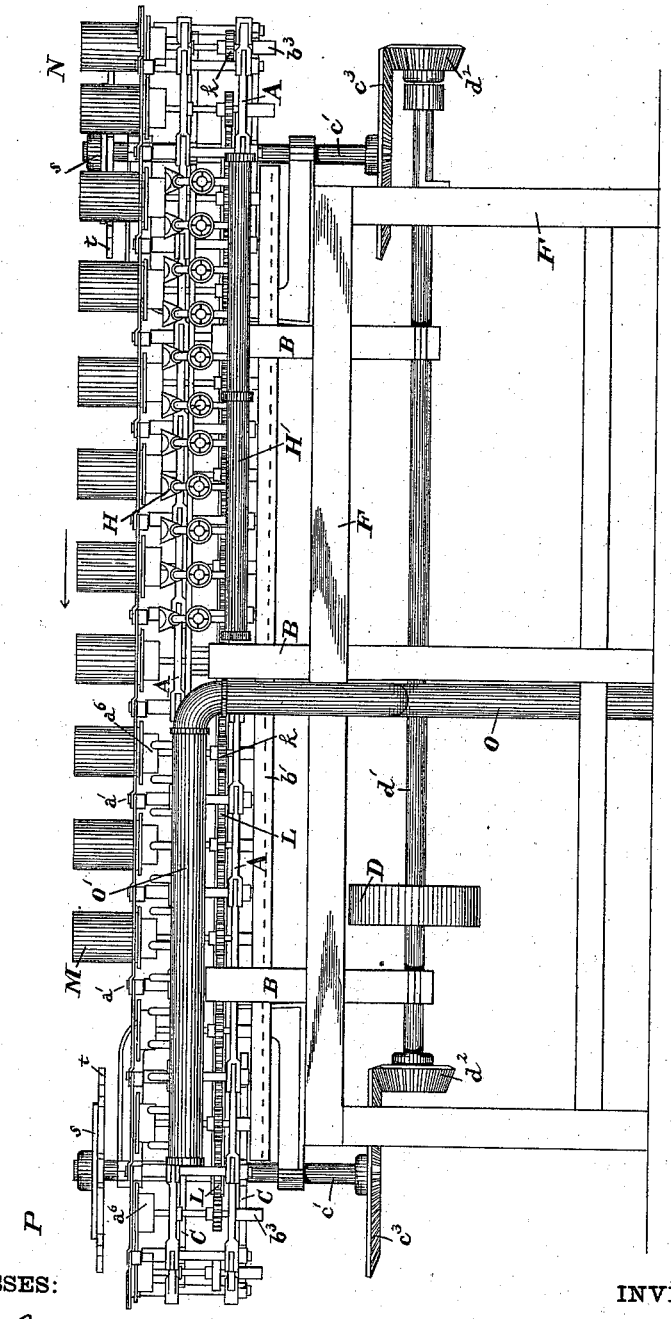

Fig. 1.

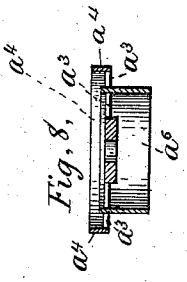

Fig. 8.

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INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

W. M. EMMART.

CAN SOLDERING MACHINE.

No. 382,463. Patented May 8, 1888.

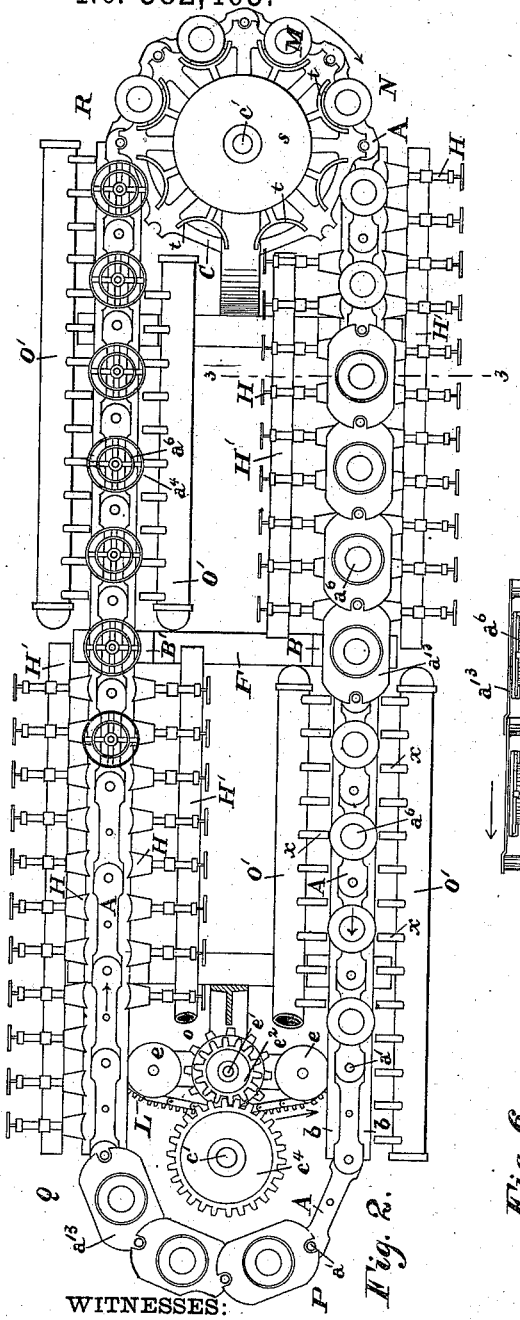

Fig. 2.

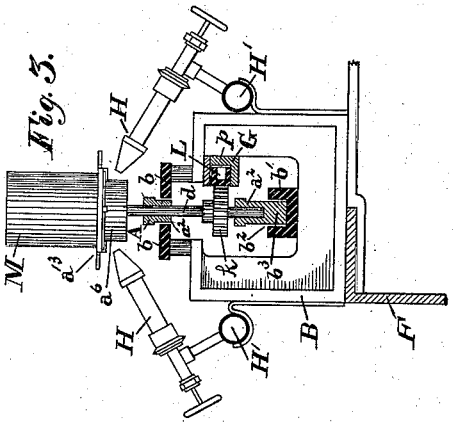

Fig. 3.

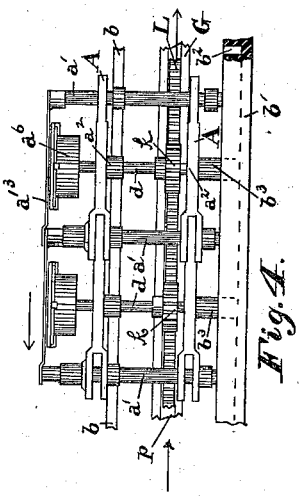

Fig. 4.

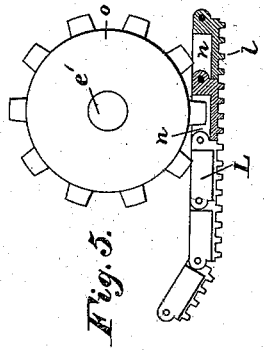

Fig. 5.

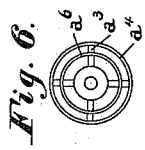

Fig. 6.

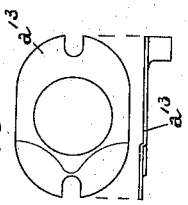

Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM M. EMMART, OF BALTIMORE, MARYLAND.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 382,463, dated May 8, 1888.

Application filed March 15, 1888. Serial No. 267,221. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. EMMART, 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.

My invention relates to certain improvements in machines for soldering the heads of cans. It is more particularly an improvement on the continuously-movable endless-conveyer machine for which Letters Patent of the United States No. 362,150 were granted me May 3, 1887.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a top view of the machine. The top part of the center standard, at the left-hand end, is broken away to show the sprocket-wheel and gear-wheels. Fig. 3 is a vertical cross-section of the parts of the machine on the line 3 3 of Fig. 2. Fig. 4 shows a side view of two sections of the endless conveyer. Fig. 5 is a detail view of the sprocket-wheel and the cogged drive-chain, by which a positive rotary motion is imparted to the can-seats. Fig. 6 is a top view of a can-seat. Fig. 7 shows two views of the can-shield plate. Fig. 8 is a section view of the can seat or holder and the shield for spindle, said parts being integral or in one casting.

The letter F designates the frame or stand of the machine; B B′, standards each of which supports two upper parallel guide-bars, *b*, and a lower grooved guide-bar, *b′*, and also a chain-guide, G, located between the said upper and lower guide-bars. The guide-bars *b* and *b′* and chain-guide G are placed to form two sets, one extending along each longitudinal side of the machine. (Shown in the top view of Fig. 2.) The endless conveyer A is made in sections, which are jointed together chain fashion. The vertical pivot-bolts *a′*, which unite the conveyer-sections, travel along the space between the said guide-bars *b*, substantially as set forth in my Letters Patent above referred to.

An important difference between this machine and that shown in the patent named consists in the position of the can-seats a^6. In the said patent the can-seat is on a revoluble stem, which has bearing only in the bottom piece (or link) of a jointed section, and thereby the can M must take position below the top piece, or between the top and bottom pieces (or links) which compose the conveyer. In this machine the can-seat a^6 is on a revoluble spindle, *d*, which has bearing a^2 in both the top and bottom links of the section, (see Figs. 3 and 4,) and thereby the can M has position above or on top of the conveyer, which in practice is found to be much more convenient and satisfactory. This construction of jointed section, having top and bottom pieces, spindle *d*, having bearings in both, and can-seat a^6, gives stability and greater steadiness of rotary motion of the can-seat. No holder or disk to press on top of the can is here contemplated.

The lower guide-bar, *b′*, has a top groove, b^2, (see Figs. 3 and 4,) and each of the bottom pieces or links, A, of the conveyer has a central boss, b^3, on its lower side, which sets in the said groove b^2 of the lower bar. The lower end of the revoluble spindle *d* is stepped in the boss b^3. The entire weight of the conveyer and can-seats thus rests upon the said lower grooved guide-bar, and when the machine is in motion the bosses b^3 slide along this grooved bar.

At each end of the machine is a vertical shaft, *c′*, and each shaft carries two polygonal notched wheels, C, one of which engages with the top links and the other with the bottom links or jointed sections of the endless conveyer A. A horizontal shaft, *d′*, is below the conveyer, and is provided with a drive-pulley, D, and at each end with a bevel-pinion, d^2, which latter gears with a bevel-pinion, c^3, on each of the said vertical shafts *c′*. These driving parts are alike at both ends of the machine.

A feature of my improvement is here shown in the cogged drive-chain L, chain-guide G, and the pinion *k*, located on the spindle *d*, between its two bearings, a^2. Each can-seat spindle *d* is provided, intermediate of its bearings in the top and bottom link, with a pinion, *k*, and a special chain, L, comprises links, each having cog-teeth *l* on one side and a socket, *n*, on the opposite side. The cog-teeth *l* engage with the said pinions *k*, and the sockets *n* receive the teeth of a sprocket-wheel, *o*, by which latter motion is imparted to the chain. As already stated, there are two chain-guides G, one extending along each longitudinal side of

the machine. Each chain-guide occupies a horizontal plane intermediate of or between the upper and lower guide-bars, *b b'*. The chain L slides along these guides, and is sustained thereby. Each guide has a vertical back, *p*, which the socket side of the links rest against, and in moving along the longitudinal side of the machine the links are kept in position, where their cog-teeth *l* will remain engaged with the said pinions *k*. As the pinions and chain L are between the upper and lower guide-bars and also between the two spindle-bearings a^2, the pressure of the chain on the spindles causes no bad effects, as in those cases where the pinion is on the lower end of the spindle and the latter has but one bearing. At the ends of the machine the chain L leaves the guides G and passes around pulleys or wheels *e*. The sprocket-wheel *o* is on a vertical shaft, *e'*, which has a gear-wheel, e^2, and the shaft *c'* also has a gear-wheel, c^4, which gears with it. The movement of the chain G is in a circuit in a direction opposite that in which the conveyer A moves.

The can-seat consists of cross-bars a^3, radiating from a hub, and an open circular or cylindric shield, a^6, attached to the four cross-bars and depending downward and surrounding the upper end of the spindle *d*, to which the can-seat hub is attached, and a ring, a^4, at the ends of the cross-bars and larger than the circular shield a^6. The shield a^6 is a seat for the can and protects the upper end of the spindle *d* from the flame of the burner, and the ring a^4 surrounds the end of the can. The burners H are attached to supply-pipes H'. Two pipes H' are placed parallel, and both are used in connection with the can-seats at one heating-point, as will be seen in Figs. 2 and 3. The can-seats pass between two sets of burners. From five to twelve burners may be used in each set. The flame of the burners plays upward against the lower head-seam of the can. The burners are so placed that the flame spreads, and part of it takes effect on the outside of the open cylindric shield a^6, which thus protects the spindle *d* from heat and prevents the oil-lubricant at its upper bearing, a^2, from being burned. The flame reaches the end seam of the can between the seat or shield a^6 and the outer ring, a^4.

The can-shield plate a^{13} is constructed and operates the same as that described in my former patent.

It will be seen that the machine here shown is designed to solder cans while they pass along each of the two longitudinal sides. On one side of the machine the cans to be soldered are placed on the can-seats at one end at the point N. Each can contains a piece of solder of proper size for the end seam. The conveyer moves in the direction of the darts and carries the cans between the two sets of burners, whereby the cans are heated and the solder melted in the seam. Now, in order to hasten the cooling of the cans, an air-blower is provided. Cold air may be supplied from any suitable air-forcing device and delivered into the pipe O, from whence it passes to the pipes O', which are parallel in sets of two, like the burner-supply pipes. Nozzles *x* are on the air-pipes O', and deliver jets of cold air onto the hot seam of the cans. By the time the cans have reached the other end of the machine, at the point P, they will have become cool enough to remove, or to be reversed end for end, and placed on the can-seats at the other side of the machine at the point Q. Another piece of solder being deposited within the can, the latter will go through the same process of heating, soldering, and cooling until it reaches the end of the machine at the point R, where it is finally removed.

The vertical shaft *c'* at each end of the machine, in addition to the polygonal wheel which engages with the links or sections of the conveyer, has at its top a can-guiding wheel which consists of a hub, *s*, provided with arms, each having a segment-shaped can-guide, *t*. The cans M, when properly on the seats a^6, will be centered by the guides *t*. The guides *t* therefore facilitate placing the cans on the seats evenly.

As shown in the drawings, the machine stands vertically, and the continuously-movable endless conveyer moves in a horizontal plane. This position of the machine and this plane for the movement of the conveyer are not material. It is obvious that these may be different from what is shown in the drawings without departing from my invention. For instance, the machine, instead of standing vertically, may be inclined to one side, so that the conveyer will move in an inclined plane, thereby to have the cans slightly inclined while rotating, with the view of facilitating the flow of the melted solder into the end seam of the can.

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

1. The combination, in an endless conveyer for a can-soldering machine, of the jointed sections having top and bottom links, a revoluble spindle, *d*, which has bearing in both the top and bottom links, and a can-seat, a^6, on the upper end of the spindle and above the said top link.

2. The combination, in an endless conveyer for a can-soldering machine, of the jointed sections having top and bottom links, the said bottom links having on their lower sides a central boss, b^3, a revoluble spindle, *d*, which has its lower end stepped in said boss, a can-seat on the upper end of the spindle, two upper guide-bars, *b*, and a lower guide-bar having a groove in its top to receive the said bosses.

3. The combination, in a can-soldering machine, of the endless conveyer composed of jointed sections, each having a top and bottom link, a revoluble can-seat spindle which has bearing in both the said top and bottom links and is provided intermediate of its said

bearings with a pinion, *k*, and an endless chain engaged with the said pinion, as shown and described.

4. The combination, in a can-soldering machine, of the endless conveyer composed of jointed sections, each having a top and bottom link, a revoluble can-seat spindle which has bearing in both the said top and bottom links and is provided intermediate of its said bearings with a pinion, *k*, an endless chain, each link of which has on one side cog-teeth *l* and on the opposite side a socket, *n*, and a sprocket-wheel, *o*, as shown and described.

5. The combination, in a can-soldering machine, of the endless conveyer composed of jointed sections, each having a top and bottom link, a revoluble can-seat spindle which has bearing in both the said top and bottom links and is provided intermediate of its said bearings with a pinion, *k*, upper guide-bars, *b*, a lower guide-bar, *b'*, a chain-guide located between the said upper and lower guide-bars, and an endless chain movable along said chain-guide and engaged with the pinions, as shown and described.

6. The combination, in a can-soldering machine, of a conveyer having revoluble spindles *d*, and a can-seat having two crossed bars, a^3, radiating from a hub which is attached to the said spindle, and an open cylindric shield, a^6, attached to said crossed bars and depending from them and surrounding the upper end of the spindle, which latter is thereby protected from the flame, as shown and described.

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

WILLIAM M. EMMART.

Witnesses:

JNO. T. MADDOX,

JOHN E. MORRIS.